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## A | Biologie

Fish species of La Réunion ■ Lomechusini from the Palaearctic region ■ Amarygmini of the Philippines ■ *Laena* in the Indian Himalayas ■ Chrysomelidae from New Guinea ■ *Cyathea caracasana* complex ■ Woody angiosperm taxa of Canarian laurel forests

STAATLICHES MUSEUM FÜR NATURKUNDE STUTTGART

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# Annotated checklist of the fish species (Pisces) of La Réunion, including a Red List of threatened and declining species

Ronald Fricke, Thierry Mulochau, Patrick Durville, Pascale Chabanet, Emmanuel Tessier & Yves Letourneur

Abstract

An annotated checklist of the fish species of La Réunion (southwestern Indian Ocean) comprises a total of 984 species in 164 families (including 16 species which are not native). 65 species (plus 16 introduced) occur in freshwater, with the Gobiidae as the largest freshwater fish family. 165 species (plus 16 introduced) live in transitional waters. In marine habitats, 965 species (plus two introduced) are found, with the Labridae, Serranidae and Gobiidae being the largest families; 56.7 % of these species live in shallow coral reefs, 33.7 % inside the fringing reef, 28.0 % in shallow rocky reefs, 16.8 % on sand bottoms, 14.0 % in deep reefs, 11.9 % on the reef flat, and 11.1 % in estuaries. 63 species are first records for Réunion. Zoogeographically, 65 % of the fish fauna have a widespread Indo-Pacific distribution, while only 2.6 % are Mascarene endemics, and 0.7 % Réunion endemics.

The classification of the following species is changed in the present paper: *Anguilla labiata* (Peters, 1852) [previously *A. bengalensis labiata*]; *Microphis millepunctatus* (Kaup, 1856) [previously *M. brachyurus millepunctatus*]; *Epinephelus oceanicus* (Lacepède, 1802) [previously *E. fasciatus* (non Forsskål in Niebuhr, 1775)]; *Ostorhinchus fasciatus* (White, 1790) [previously *Apogon fasciatus*]; *Mulloidichthys auriflamma* (Forsskål in Niebuhr, 1775) [previously *Mulloidichthys vanicolensis* (non Valenciennes in Cuvier & Valenciennes, 1831)]; *Stegastes luteobrunneus* (Smith, 1960) [previously *S. fasciolatus* (non Ogilby, 1889)].

Due to rapid economic and agricultural development and population growth during the past centuries and decades, the native fish fauna of Réunion is now highly threatened and needs urgent political action to ensure its conservation. The marine fish species of Réunion are threatened by eutrophication/pollution, by overfishing and poaching, by marine aquaculture, and by construction along the shore; additional regional threats include long-ranging marine eutrophication and pollution, destruction of coastal areas, marine acidification, and global warming. Freshwater habitats are threatened by eutrophication and pollution, by the construction of dams, weirs and barrages, water abstraction for irrigation, gravel extraction from river beds, some special fisheries techniques (like 'bichique' fishing, including strong seasonal poaching pressure), introduction of exotic species, and aquaculture.

Out of a total of 968 native fish species of Réunion, 374 species (39.2 %) are on the Red List, with 18 species regionally extinct (1.9 %), 27 species critically endangered (2.8 %), 115 species endangered (11.9 %), 160 species vulnerable (16.6 %), 32 species near threatened (3.3 %), and 26 species threatened migrants (2.7 %). An additional 575 species are data deficient (59.4 %). 16 species have been introduced and are thus not native; they were not evaluated for the Red List. Only the remaining 10 species in Réunion are not threatened. In addition to the Red List, a list of taxa proposed for the Annexes II, IV and/or V of the EU Habitats Directive is presented. A set of measures for the conservation of the Réunion fish fauna is proposed.

Keywords: Checklist, Red List, threatened and declining species, Pisces, marine, freshwater, transitional waters, new records, Réunion, southwestern Indian Ocean, IUCN criteria, EU Habitats Directive, EU Water Framework Directive.

Zusammenfassung

Die Checkliste der Fische von Réunion (südwestlicher Indischer Ozean) enthält 984 Arten in 164 Familien (einschließlich 16 nicht einheimischen Arten). 65 Arten (sowie 16 eingeführte) leben im Süßwasser, mit den Gobiidae als artenreichster Süßwasserfischfamilie. 165 Arten (sowie 16 eingeführte) leben in Übergangsgewässern (Brackwasser). Im Meer werden 965 Arten (sowie eine eingeführte) gefunden, mit den Labridae, Serranidae und Gobiidae als artenreichste Familien. 56,7 % dieser Arten leben in seichten Korallenriffen, 33,7 % innerhalb des Saumriffes, 28,0 % in seichten Felsriffen, 16,8 % auf Sandböden, 14,0 % in tiefen Riffen, 11,9 % auf der Riffplattform, und 11,1 % in Ästuaren. 63 Arten werden zum ersten Mal in Réunion gefunden. Zoogeographisch haben 65 % der Fischarten eine großräumige indo-pazifische Verbreitung, während nur 2,6 % endemisch bei den Maskarenen und 0,7 % endemisch in Réunion sind.

Die Klassifikation der folgenden Arten wird in der vorliegenden Arbeit geändert: *Anguilla labiata* (Peters, 1852) [bisher *A. bengalensis labiata*]; *Microphis millepunctatus* (Kaup, 1856) [bisher *M. brachyurus millepunctatus*]; *Epinephelus oceanicus* (Lacepède, 1802) [bisher *E. fasciatus* (non Forsskål in Niebuhr, 1775)]; *Ostorhinchus fasciatus* (White, 1790) [bisher *Apogon fasciatus*]; *Mulloidichthys auriflamma* (Forsskål in Niebuhr, 1775) [bisher *Mulloidichthys vanicolensis* (non Valenciennes in Cuvier & Valenciennes, 1831)]; *Stegastes luteobrunneus* (Smith, 1960) [bisher *S. fasciolatus* (non Ogilby, 1889)].

Durch die schnelle ökonomische und landwirtschaftliche Entwicklung und das starke Bevölkerungswachstum in Réunion während der letzten Jahrhunderte und Jahrzehnte ist die Fischfauna inzwischen stark gefährdet und benötigt dringend politische Maßnahmen, um erhalten zu bleiben. Die marine Fischfauna wird durch Verschmut-

zung und Eutrophierung aus einfließenden Flüssen und Küstenstädten gefährdet, sowie durch Überfischung und Fischwilderei, marine Aquakultur (Verschmutzung, Eutrophierung und entwichenes Fischmaterial), Baumaßnahmen entlang der Küste (Hotels und Erweiterung der Küstenstädte sowie Bau von Küstenstraßen), marine Wasserversauerung und globale Erwärmung. Auch im Süßwasser sind die meisten Flüsse in ihren Unterläufen eutrophiert und verschmutzt. Weitere Gefährdungsursachen bestehen im Bau von Wehren und Staudämmen, in Wasserentnahme zur Bewässerung von Feldern, Kiesentnahme, Fischerei und Fischwilderei, Einführen gebietsfremder Arten und Süßwasser-Aquakultur.

Von 968 einheimischen Fischarten von Réunion stehen 378 auf der Roten Liste (39,2 %), mit 18 regional ausgestorbenen Arten (1,9 %), 27 vom Aussterben bedrohten (2,8 %), 115 stark gefährdeten (11,9 %), 160 gefährdeten (16,6 %), 32 potenziell gefährdeten Arten (3,3 %) und 26 gefährdeten Wanderfischen (2,7 %). Bei weiteren 575 Arten ist die Datenlage unklar (59,4 %); 16 Arten sind nicht heimisch. Nur die übrigen 10 Arten werden derzeit als nicht gefährdet betrachtet. Zusätzlich zur Roten Liste wird eine Liste von Taxa zur Erweiterung der Annexe II, IV und V der EU-FFH-Richtlinie vorgeschlagen. Ebenso werden allgemeine Empfehlungen zum Schutz der Fischfauna von Réunion gegeben.

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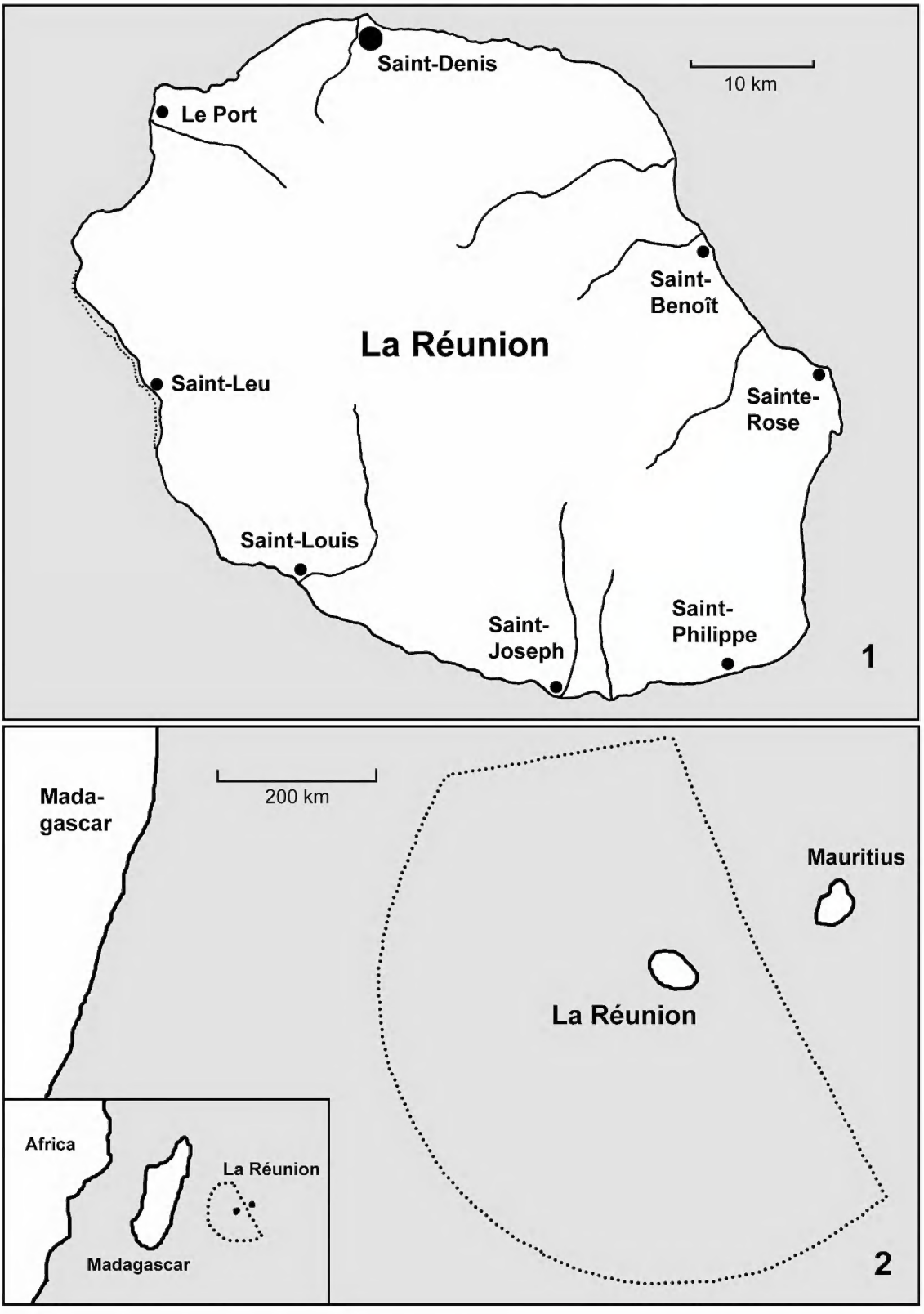
## 1 Introduction

La Réunion, is the westernmost island of the Mascarenes, situated approximately 800 km east of Madagascar; other Mascarene islands are Mauritius (150 km ENE of Réunion), and Rodrigues (600 km ENE of Mauritius). Réunion (Fig. 1) is a relatively young island with two high volcanic mountain ranges (the southeastern range bearing an active volcano), raising to an altitude of 3070 m, and covering a total area of 2512 km$^2$. Except for a few narrow fringing coral reefs in the west and southwest, nowhere further than 500 m from the shore, most shores are either rocky or covered with gravel, often exposed to high surf. As the island is basically a large volcano situated on a submarine hotspot, the island slopes are steeply descending into the deep sea.

Arab sailors formerly called the island Adna Al Maghribain ("Western Island"). The first Europeans to explore the Mascarenes were Portuguese in July 1500 (Diogo Dias); the group was named after Don Pedro Mascarenhas, another Portuguese explorer who visited the islands in 1512–1516. The Portuguese found the island uninhabited, and named it Santa Apollonia, after Saint Apollonia. The island was then occupied by France, and later administered from Port Louis, Mauritius. Although the French flag was hoisted by François Cauche in 1638, Santa Apollonia was officially claimed by Jacques Pronis of France in 1642, when he deported a dozen French mutineers to the island from Madagascar. The convicts were returned to France several years later, and in 1649, the island was named Île Bourbon after the royal house. The island's name was changed into Île de la Réunion in 1793, after the French Revolution, and then again to Île Bonaparte (1801–1810). After a French-British war in the Indian Ocean (1800–1810), Isle-de-France and Rodrigues (the former now named Mauritius) were given to Britain in 1814 (as a result of the Vienna Congress, 1814/1815, ending the Napoleonic wars), while the Île Bonaparte remained French (again named 'Réunion' since 1848). The latter became a French overseas department (Département d'outre mer) in 1946, and is since 2003 a French overseas region (Région d'outre mer), as an integral part of the European Union.

Since the late 18$^{th}$ century, fish specimens collected in Réunion and Mauritius went to Paris. They were mainly collected by P. Commerson (1768–1773), J.-B. L. T. Leschenault de la Tour (1818), L. A. G. Bosc (1826), T. Delisle (1829), J. Desjardins (1834–1840), and J.-J. Dussumier (1830–1835); biographies see Whitehead & Bauchot (1985: 53–64) and Bauchot et al. (1990: 53–136). In Paris, the material was principally studied by Lacepède, Cuvier and Valenciennes. Many species were described in the five volumes of the Histoire Naturelle des Poissons by Lacepède (1798–1803), and later in the 22 volumes under the same title by Cuvier & Valenciennes between 1828 and 1850. Prior to 1850, the Mascarenes (besides South Africa) were the area ichthyologically known best in the Indian Ocean. The first attempt to publish a checklist of the fishes known from the islands was that of Guichenot (1863) who recorded 326 nominal species from Réunion. In their checklist of the fishes of Zanzibar, Playfair & Günther (1867) listed 103 nominal species from Réunion. Bleeker (1874) refers to 361 nominal species of fishes from Réunion (including five new species); however, Bleeker used many synonyms, and his list contained double, triple and quatruple references to single species. Sau-




**Figs. 1–2.** Study area. – **1**. La Réunion, indicating rivers and streams, as well as the coral reef (dotted line). **2**. Extent of the EEZ (Exclusive Economic Zone) of La Réunion (based on Anonymus 2006b).

VAGE (1891), in his natural history of the fishes of Madagascar, recorded 87 nominal species of fishes from Réunion.

Since the 1950s, many groups of Indo-Pacific fishes have been revised. As a result, we know that earlier lists included numerous misidentifications of species. There are also several duplications of names due to the older authors not knowing that males and females of some fishes have very different colour phases, and that some juveniles may be strikingly different in colour from adults. Sexual dichromatism is particularly common among the wrasses (Labridae) and the parrotfishes (Scaridae).

BLANC & POSTEL (1958) reported on a collection of fishes from Réunion (71 nominal species), which was rediscovered by the first author of the present monograph in the collection of the MNHN in 1998. GUÉZÉ & FOURMANOIR (1960) and FOURMANOIR & GUÉZÉ (1961a, 1961b, 1962a, 1962b, 1963) compiled a catalogue of 226 nominal, mainly commercially used fish species from Réunion. HARMELIN-VIVIEN (1976) listed 258 nominal species of fishes from Réunion. FRICKE (1999) presented an annotated checklist of the fishes of the Mascarenes, recording 868 species from Réunion (including 132 new records), with a total Mascarene ichthyofauna of 1123 species. He also discussed the zoogeography of the Mascarenes. KEITH et al. (1999) revised the freshwater fish fauna of Réunion and distinguished 22 native and five introduced species. LETOURNEUR et al. (2004) published an updated checklist of the marine fishes of La Réunion with 28 new records, including 885 species, and provided an ecological characterisation of the fish species. During an eruption of the Piton de la Fournaise volcano in April 2007, 34 additional species were recorded from the island, including undescribed species (DURVILLE et al. submitted).

The most recent checklists of the other Mascarene islands are by FRICKE (1999) for Mauritius (992 species) and Rodrigues (254 species), and by HEEMSTRA et al. (2004) for Rodrigues (493 species). The relatively low Rodrigues fish species number is partly due to less collecting effort compared with Mauritius and Réunion, but also due to the remote and isolated position of this island.

Several museums hold important collections of fishes from Réunion. The largest collections are housed at the MNHN (Paris), SMNS (Stuttgart), MHNRUN (Saint-Denis), LEMUR (Saint-Denis), and BPBM (Honolulu). Approximately 75 % of the species recorded in the present paper are based on specimens in collections, including material collected by the authors; the remaining species are either based on visual records, published revisions, or (in a few cases) historical checklists.

The present paper provides an updated list of all fish species occurring in Réunion, their distribution, habitats, threat and decline status to form a basis for future conservation in the context of La Réunion regional legislation, French national legislation, the EU Habitats Directive and the EU Water Framework Directive.

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The authors and the editor of the journal are grateful to J. E. RANDALL (Hawai'i) for providing a photo of *Acanthurus polyzona* as the cover picture for this volume.

## 2 Methods and Materials

All species known to occur naturally in La Réunion are listed in the present paper. Introduced species which are not autochthonous to La Réunion are also listed, but are not evaluated for the Red List. The previous checklists of FRICKE (1999) and LETOURNEUR et al. (2004) are taken as a baseline; the taxonomy, however, was updated, and additional records were added. Records from Réunion are based on species names; a first record means that a species is recorded for the first time under this name, even if it was misidentified before. The taxonomic classification mainly follows ESCHMEYER & FRICKE (2008); if not, the source of the classification is given as a remark. Most of the English names follow FROESE & PAULY (2008).

The checklist and Red List of the fishes of Réunion covers the whole area of Réunion including the Exclusive Economic Zone (EEZ) (Fig. 2). All species known from this area are listed, including deep sea species, pelagic offshore species, and introduced species. The native ichthyofauna of La Réunion is here defined as including all species naturally occurring in the area; if a species was introduced by human activities, this is indicated in the list. Specimens which could not be identified to the species level are not included in the checklist, unless they are the

only representatives of their family. Species are grouped under their family names; families are presented in taxonomical order following NELSON (2006), species within a family in alphabetical order. An asterisk notes a species endemic to Réunion. Taxonomic comments are provided as appropriate, including synonyms that were used for the species in Réunion. Subspecies are no longer recognised in the present paper; former subspecific taxa are either considered as valid species or synonymised, in order to fulfil the needs of conservation as subspecific names have previously caused much confusion. In the 'Distribution' section, the distribution of each species around the islands of the southwestern Indian Ocean is indicated, starting with the Mascarenes, then listing Madagascar and the Comores, followed by other islands in a clockwise order towards Cargados Carajos. If a species occurs only occasionally in the area as a migrant or has been introduced, this is indicated as well. The main habitat(s) are indicated for each species, including a depth range for marine species. It is also stated if a species occurs in freshwater, transitional water, and/or marine water, which is of special relevance for the application of the EU Water Framework Directive (Anonymus 2000b) under which freshwater and transitional water fish species are to be regularly monitored. Finally, the geographic distribution of the species outside the southwestern Indian Ocean, habitat and depth are given, based on various sources, including revisions, checklists and own observations. Habitats of the species are also given; in the case of shallow fringing coral reefs, species occurring on the reef flat, in the lagoon and in tidal pools are also separately recorded.

Red list categories were used as published by IUCN (Anonymus 2001, 2003, 2005). The present red list is using the categories EX (extinct) and EW (extinct in the wild; both not relevant for this paper), RE (regionally extinct), CR (critically endangered), EN (endangered), VU (vulnerable), NT (near threatened), LC (least concern), DD (data deficient) and NE (not evaluated); the latter three categories are not considered in Red List evaluations. For marine fishes with large distribution ranges, the additional category TM (threatened migrants) is used, which is defined as a species that would fall under the categories EN or CR but occurs in the area only as a straggler, and where the main threat may occur outside the area. Some threatened migrants have extremely wide distribution ranges and are stragglers throughout their ranges.

For prioritising species that need urgent action, the 'Conservation Cube' model used by OSPAR (Anonymus 2000a) and HELCOM (FRICKE 2007) is applied in the present paper. Threats to the fish species are assessed; they fall into the categories listed and explained in Tab. 1.

The use of the terms 'global importance' and 'local importance' follows OSPAR (Anonymus 2000a) and HELCOM (FRICKE 2007); the terms are defined in Tab. 2. 'Rarity' and 'sensitivity' are defined in Tab. 3. A 'keystone species' is defined as a species which has a controlling influence on a community, following Anonymus (2000a: 10, Appendix 5). For example, members of the family Istiophoridae are here classified as keystone species as their presence has a controlling influence on the population of *Remora brachyptera*, and on several specialised

**Tab. 1.** Main threats for threatened and declining species of fishes in Réunion, ordered by importance of the criteria.

| Threat abbreviation | Description | Definition |
|---|---|---|
| FIT | Fishery (target species) | A species that is commercially exploited as a target species. |
| FIB | Fishery (bycatch) | A species that is not regularly commercially exploited, but frequently caught as bycatch in fisheries. |
| HAB | Habitat loss | A species that is threatened by a loss of its habitat (silted sand bottoms due to eutrophication, disappearing seagrass beds, coral reef degradation, etc.). |
| EUT | Eutrophication/pollution | A species that is threatened by effects of eutrophication (nutrient-rich water, oxygen deficiency, etc.), or various effects of organic or inorganic pollution, such as oil spills, various chemicals, hormones etc. |
| CON | Construction/weirs/dams in rivers and streams | A migratory species that is threatened inland by construction measures in rivers and streams, e. g. weirs, dams. |
| AQU | Aquaculture/introduction | A species that is threatened by aquaculture or introduction (change of genetics; competition by introduced species). |
| PRL | Prey loss | A species that is threatened by the loss of the main prey species. |
| PAR | Parasites | A species that is threatened by health problems due to parasites. |
| HOS | Loss of host species | A species that is threatened by the loss of the main host species. |

**Tab. 2.** Definitions of localnesss (global and local importance) and guidance on selection criteria.

| Criterion | Definition and Guidance |
|---|---|
| Global importance | Global importance of the Réunion population(s) for a species. Importance on a global scale, of Réunion, for the species is when a high proportion of a species at any time of the life cycle occurs in Réunion. – 'High proportion' is considered to be more than 75 % (of the world populations), when known. |
| Local importance | Importance within Réunion, of the regions for the species where a high proportion of the total population of a species within Réunion for any part of its life cycle is restricted to a small number of locations in Réunion. – 'High proportion' is considered to be 90 % of the population in a small number of locations of 50 km × 50 km grid squares. This is dependent on scientific judgement regarding natural abundance, range or extent and adequacy of recording. A different scale may be needed for different taxa. |

**Tab. 3.** Definitions of rarity and sensitivity and guidance on selection criteria.

| **Rarity criterion** | **Definition and Guidance** |
|---|---|
| Rare | A species is rare if the total population is small. In case of a species that is sessile or of restricted mobility at any time of its life cycle, a species is rare if it occurs in a limited number of locations in Réunion, and in relatively low numbers. In case of a highly mobile species, the total population size will determine rarity. – 'A limited number of locations' could be in a small number of 50 km × 50 km grid squares, but a different scale may be needed for different taxa. This is dependent on scientific judgement regarding natural abundance, range or extent and adequacy of recording. |
| | |
| **Sensitivity criteria** | **Definition and Guidance** |
| Very sensitive species | A 'very sensitive' species is one if very easily adversely affected by a human activity, and/or if affected is expected only to recover over a very long period, or not at all. – A 'very long period' may be considered to be more than 25 years. Sensitivity to human activities is measured by (a) life history characteristics; (b) dependence on other specific ecological attributes e. g. restricted/specific habitat requirements |
| Sensitive species | A 'sensitive' species is one if easily adversely affected by a human activity, and/or if affected is expected to recover in a long period. – A 'long period' may be considered to be in the range of 5 to 25 years. Sensitivity as above. |

**Tab. 4.** Guidance on decline as a selection criterion for species.

| **Criterion** | **Guidance** |
|---|---|
| Extirpated (= Extinct) | A population of a species formerly occurring in aquatic habitats is defined as extirpated<br>• if it was still occurring in the area at any time during the last 100 years.<br>• and if there is a high probability, or it has been proved, that the last individuals have since died or moved away<br>• or if surveys in the area have repeatedly failed to record a living individual in its former range and/or known or expected habitats at appropriate times (taking into account diurnal, seasonal, annual patterns of behaviour) for at least 10 years. |
| Severe decline | A population of species occurring in aquatic habitats is defined as severely declined<br>• if individual numbers show an extremely high and rapid decline in the area over an appropriate time frame, or the species has already disappeared from the major part of its former range in the area<br>• or if individual numbers are at a severely low level due to a long continuous and distinct general decline in the past. |
| Significant decline | Means a considerable decline in number, extent or quality beyond the natural variability and in an appropriate frame for that species |
| Regional significant decline | Significant decline in two or more Réunion regions, but not in its whole distribution range within Réunion. |
| Probable decline | High probability of a significant decline in number, extent or quality in the future. |

**Tab. 5.** Application of the 'Conservation Cube' approach for the selection of priority species. – Step 2. Species grouped on decline into high (H), medium (M) and low (L) priorities (Anonymus 2000a: 10, Appendix 5).

| | **Stable population** | **Probable decline** | **Regional significant decline** | **Significant decline** | **Severe decline** | **Extinct** | **Not known** |
|---|---|---|---|---|---|---|---|
| GREEN | L | M | L | L | H | H | L |
| AMBER | M | M | H | H | H | H | M |
| RED | H | H | H | H | H | H | H |

parasite species. In another example, the deep demersal species *Neoscopelus macrolepidotus* was classified as a keystone species as this common species is a major food item for deep demersal predators, controlling their populations.

An important selection criterion for species that is used to finally classify priorities is decline (Anonymus 2000a: 2, Appendix 1). Decline here means an observed or indicated significant decline in numbers, extent or quality (quality refers to life history parameters). The decline may be historic, recent or current. 'Significant' need not be in a statistical sense. Decline parameters are listed in Tab. 4. If population data of a species are inadequate, but the species is restricted to a certain habitat with

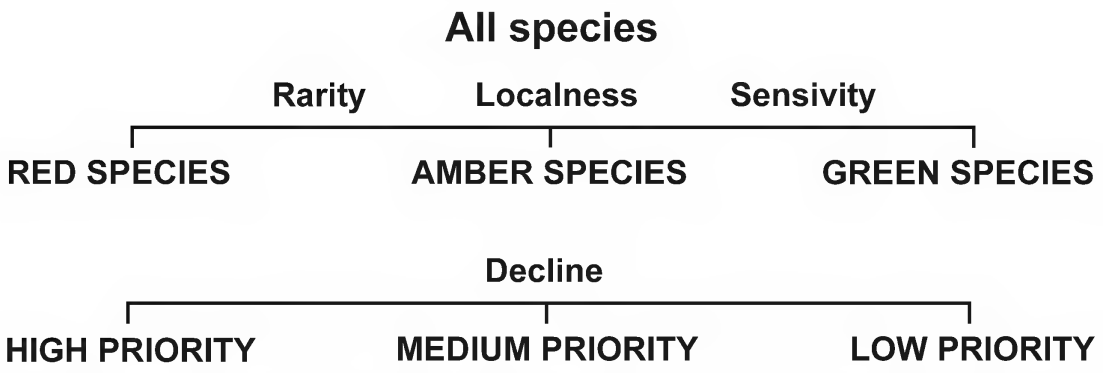


**Fig. 3.** Application scheme for 'Conservation Cube' approach for the selection of species. – Species are first grouped on localness (see Tab. 2), rarity and sensitivity (see Tab. 3) (considering keystone species) into red, amber and green lists (see Fig. 4); they are then grouped on decline into high, medium and low priorities (see Tab. 5) (Anonymus 2000a: 10, Appendix 5).

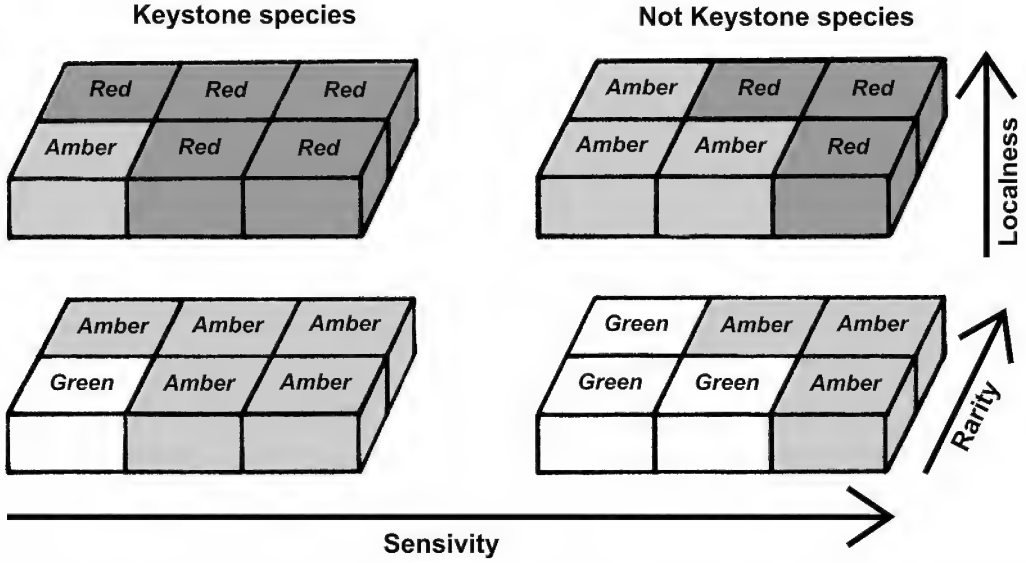


**Fig. 4.** Application of the 'Conservation Cube' approach for the selection of priority species. – Step 1. Grouping of species on localness, rarity and sensitivity (considering keystone species) into red, amber and green lists. Red is represented by dark grey shaded cubes, amber by light grey shaded cubes, green by white cubes (Anonymus 2000a: 10, Appendix 5).

good available decline data, then the decline of the species is estimated from the habitat decline.

The prioritisation procedure follows the scheme used by OSPAR and HELCOM (cited above). Beginning with a list of all species, the selection criteria 'localness', 'rarity' and 'sensitivity' are used together to establish whether a species should be considered to be on a 'red', 'amber' or 'green' list (Figs. 3–4, Tab. 5). Where a species is considered to be a 'keystone species' then the probability of being red listed is increased. The criteria decline is then used as the final selector to establish whether a species is listed as a low, medium or high priority for conservation action. The criterion 'sensitivity to human impacts' is used to inform what conservation action may be appropriate (in effect 'ranking' species on the list). Finally, those species which are of 'global importance' are 'starred' in a similar fashion to habitats and species listed in the EU Habitats Directive. Testing the criteria will help to refine the priorities used in the decline table, resulting in low, medium or high priorities.

Out of the high priority species, a selection is proposed as candidate species for the Annexes II, IV and/or V of the EU Habitats Directive (Anonymus 1992).

Abbreviations

| | |
|---|---|
| EU | European Union (http://europa.eu/) |
| FAO | Food and Agriculture Organisation of the United Nations (http://www.fao.org/) |
| HELCOM | Helsinki Commission (Baltic Sea Environment Protection Commission) (http://www.helcom.fi/) |
| IUCN | The World Conservation Union (http://www.iucn.org/) |
| OSPAR | OSPAR (Oslo-Paris) Commission for the Protection of the Marine Environment of the North-East Atlantic (http://www.ospar.org/) |

Repositories

| | |
|---|---|
| BMNH | The Natural History Museum [formerly: British Museum (Natural History)], London, UK |
| BPBM | Bishop Museum [formerly: Bernice P. Bishop Museum], Honolulu, Hawai'i, USA |
| LEMUR | Laboratoire d'Écologie Marine, Université de La Réunion, Saint-Denis, La Réunion, France |
| MHNG | Muséum d'Histoire Naturelle, Genève, Switzerland |
| MHNRUN | Muséum d'Histoire Naturelle, Saint-Denis, La Réunion, France |
| MNHN | Muséum National d'Histoire Naturelle, Paris, France |
| NHMI | Natural History Museum and Institute, Port Louis, Mauritius |
| NMW | Naturhistorisches Museum, Vienna, Austria |
| NSMT | National Science Museum, Tokyo, Japan |
| RMNH | Naturalis – Nationaal Natuurhistorisch Museum [formerly: Rijksmuseum van Natuurlijke Historie], Leiden, Netherlands |
| SAIAB | South African Institute for Aquatic Biodiversity, National Research Foundation, Grahamstown [formerly: Rhodes University, J. L. B. Smith Institute of Ichthyology], South Africa |
| SMF | Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt/Main, Germany |
| SMNS | Staatliches Museum für Naturkunde, Stuttgart, Germany |
| USNM | Smithsonian Institution, National Museum of Natural History, Washington DC, USA |
| ZMUC | Zoologisk Museum, Copenhagen, Denmark |

## 3 Annotated checklist and Red List of the fish species of Réunion

### Alopiidae – Thresher sharks

*Alopias superciliosus* (Lowe, 1841) – Bigeye thresher; Renard à gros yeux

Taxonomy. First record from Réunion by Fricke (1999: 15–16).

Distribution. Réunion, Mauritius. Marine species. Pelagic, at depths of 0–500 m. Outside the area, worldwide in tropical and temperate seas.

Conservation. Endangered in Réunion (EN). Threats: FIB, PRL. Sensitive to human activities. Severe decline. Low priority for conservation action. Highly migratory species, listed on Annex I of the 1982 Convention on the Law of the Sea (Anonymus 1994).

*Alopias vulpinus* (Bonnaterre, 1788) – Thintail thresher; Loup de mer (Réunion), faux (France)

Taxonomy. First record from Réunion by Guichenot (1863: C31) as *A. vulpes*; record confirmed by Fricke (1999: 16), based on MHNRUN material.

Distribution. Réunion, Mauritius. Transitional water and marine. Pelagic, at depths of 0–550 m. Outside the area, worldwide in tropical and temperate seas.

Conservation. Endangered in Réunion (EN). Listed as vulnerable by IUCN (Fowler 2006). Threats: FIB, PRL. Sensitive to human activities. Severe decline. Low priority for conservation action. Highly migratory species, listed on Annex I of the 1982 Convention on the Law of the Sea (Anonymus 1994).

### Lamnidae – Mackerel sharks

*Carcharodon carcharias* (Linnaeus, 1758) – Great white shark; Grand requin blanc

Taxonomy. First record from Réunion by Fricke (1999: 14–15).

Distribution. Réunion, Mauritius. Transitional water and marine. Found near coral or rocky reefs, or pelagic, also entering estuaries, at depths of 0–1280 m. Outside the area, worldwide in warm temperate seas.

Conservation. Critically endangered in Réunion (CR). Threats: FIT, FIB, PRL. Rare. Very sensitive to human activities. Keystone species. Severe decline. High priority for conservation action. Listed on Appendix II of the Bern Convention (Anonymus 1979); CITES Appendix III, since 28 May 2003; CMS Appendices I and II (Anonymus 2004). Proposed for Annexes II and IV of the EU Habitats Directive, as a priori-tary species.

*Isurus oxyrinchus* Rafinesque-Schmaltz, 1810 – Shortfin mako; Taupe bleu

Taxonomy. First record from Réunion by Compagno (1984b: 2 unnumbered pp.).

Distribution. Réunion, Mauritius. Marine species. Found near coral or rocky reefs, or pelagic, at depths of 0–750 m, usually in the upper 150 m. Outside the area, worldwide in tropical and temperate seas.

Conservation. Threatened migrant in Réunion (TM). Threats: FIT, FIB. Sensitive to human activities. Significant decline. Low priority for conservation action.

### Triakidae – Smooth-hound sharks

*Mustelus mosis* Hemprich & Ehrenberg, 1899 – Hard-nosed smooth-hound; Émissole d'Arabie

Taxonomy. **New record** from Réunion, based on a photographed specimen collected by local fishermen, off Saint-Paul, 200 m depth, 2006 (T. Mulochau, P. Durville).

Distribution. Réunion, Mauritius. Marine species. Demersal, at depths of 20–250 m. Outside the area, Red Sea, East and South Africa east to Sri Lanka.

Conservation. Data deficient in Réunion (DD). Threats: FIT, FIB. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

### Carcharhinidae – Requiem sharks

*Carcharhinus albimarginatus* (Rüppell, 1837) – Silvertip shark; Requin pointe blanche

Taxonomy. First record from Réunion by Letourneur et al. (2004: 204). Taxonomic decision of Randall (2005: 9).

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Marine species. Found inshore and offshore, mainly associated with coral reefs, at depths of 0–150 m. Outside the area, Red Sea and East Africa east to Panama, north to southern Japan and Ogasawara Islands, south to northern Australia, New Caledonia and Tuamotu Archipelago.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, FIB, PRL. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Carcharhinus amblyrhynchos* (Bleeker, 1856) – Grey reef shark; Requin dagsit

Taxonomy. First record from Réunion by COMPAGNO (1984a: 2 unnumbered pp.; record confirmed by FRICKE (1999: 18, 21–22) under the names *C. amblyrhynchos* and *C. wheeleri* Garrick, 1982, based on MNHN material. Taxonomic decision of RANDALL (2005: 9).

Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Found on coral reefs, often in deeper areas near drop-offs to the open sea, and in shallow lagoons adjacent to areas of strong currents, as well as over deeper rocky reefs, at depths of 1–275 m. Outside the area, Red Sea and East Africa east to Marquesas and Easter islands, north to South China Sea and Hawaiian Islands, south to Lord Howe and Norfolk islands.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, FIB. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Carcharhinus brevipinna* (Müller & Henle, 1839) – Spinner shark; Requin tisserand

Taxonomy. First record from Réunion by COMPAGNO (1984a: 2 unnumbered pp).

Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Found associated with reefs, on continental and insular shelves from close inshore to offshore, at depths of 0–100 m. Outside the area, in tropical and warm temperate waters of the Atlantic and Indo-West Pacific.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, FIB. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Carcharhinus falciformis* (Müller & Henle [ex Bibron], 1839) – Silky shark; Requin soyeux

Taxonomy. **New record** from Réunion, based on specimens collected by local fishermen 20 miles west of Réunion, in 2005 (P. DURVILLE, E. TESSIER, T. MULOCHAU).

Distribution. Réunion, Mauritius, Comores, Madagascar, Aldabra. Marine species. Pelagic or near rocky or coral reefs, at depths of 18–500 m. Outside the area, worldwide in tropical oceans.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, FIB. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Carcharhinus leucas* (Müller & Henle [ex Valenciennes], 1839) – Bull shark; Requin bouledogue

Taxonomy. **New record** from Réunion, based on visual census in collaboration with local fishermen, in Saint-Paul Bay, at 50 m depth, in 2005 (P. DURVILLE, T. MULOCHAU, E. TESSIER).

Distribution. Réunion, Mauritius, Madagascar. Fresh water, transitional water, and marine. In coastal waters, estuaries and lower reaches of rivers. Outside the area, worldwide in tropical oceans.

Conservation. Data deficient in Réunion (DD). Threats: FIT, FIB. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Carcharhinus limbatus* (Valenciennes in Müller & Henle, 1839) – Blacktip shark; Requin bordé

Taxonomy. First record from Réunion by COMPAGNO (1984a: 2 unnumbered pp).

Distribution. Réunion, Mauritius, Madagascar. Transitional water and marine. Found inshore and offshore, off river mouths and estuaries, muddy bays, mangrove swamps, lagoons, and coral reef drop-offs, bottom associated or pelagic, at depths of 0–64 m. Outside the area, worldwide in tropical and warm temperate seas.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, FIB. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Carcharhinus longimanus* (Poey, 1861) – Oceanic whitetip shark; Requin à aileron blanc (Réunion), Requin océanique (France)

Taxonomy. First record from Réunion by COMPAGNO (1984a: 2 unnumbered pp).

Distribution. Réunion, Mauritius, Comores. Marine species. Found in deep water but sometimes comes close to shore, at depths of 0–180 m. Outside the area, worldwide in tropical seas.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, FIB. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Carcharhinus melanopterus* (Quoy & Gaimard, 1824) – Blacktip reef shark; Requin à pointes noires

Taxonomy. First record from Réunion by FRICKE (1999: 20).

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Freshwater, transitional water and marine. Found in shallow water close inshore on coral reefs and on reef flats, near reef drop-offs and close offshore, also in mangrove areas and in freshwater of estuaries and lower reaches of rivers, at depths of 0–80 m. Outside the area, Red Sea, East and South Africa east to Hawaiian Islands and Pitcairn Group, north to Taiwan, south to Queensland/Australia and New Caledonia.

Conservation. Regionally extinct in Réunion (RE); not seen since 1995 (LETOURNEUR et al. 2004: 207). Threats: FIT, FIB, PRL. Rare. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Carcharhinus plumbeus* (Nardo, 1827) – Sandbar shark; Requin gris

Taxonomy. First record from Réunion by COMPAGNO (1984a: 2 unnumbered pp).

Distribution. Réunion, Mauritius, Madagascar, Walters Shoal. Transitional water and marine. Found inshore and offshore, on continental and insular shelves and adjacent deep water, in bays, river mouths and in harbours, at depths of 0–280 m. Outside the area, worldwide in tropical and warm temperate waters.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, FIB. Keystone species. Significant decline. High priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Carcharhinus sorrah* (Valenciennes in Müller & Henle, 1839) – Spottail shark; Requin tacheté

Taxonomy. First record from Réunion by Compagno (1984a: 2 unnumbered pp).

Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Found near reefs, sometimes offshore, at depths of 0–140 m. Outside the area, Red Sea, East and South Africa east to Solomon Islands and northern Vanuatu, north to Taiwan, south to New South Wales/Australia and New Caledonia.

Conservation. Data deficient in Réunion (DD). Threats: FIT, FIB. Rare. Sensitive to human activities. Keystone species. Significant decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté nº 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Galeocerdo cuvier* (Péron & LeSueur in LeSueur, 1822) – Tiger shark; Requin tigre

Taxonomy. First record from Réunion by Compagno (1984a: 2 unnumbered pp); record confirmed by Fricke (1999: 22), based on MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles, Cargados Carajos. Freshwater, transitional water and marine. Found in river estuaries, off wharves and jetties in harbours, and in coral lagoons, at depths of 0–140 m. Outside the area, worldwide in tropical and warm temperate seas.

Conservation. Data deficient in Réunion (DD). Threats: FIT, FIB. Rare. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté nº 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Loxodon macrorhinus* Müller & Henle, 1839 – Sliteye shark; Requin sagrin

Taxonomy. **New record** from Réunion, based on a photographed specimen collected by local fishermen, off Saint-Paul, at 100 m depth, in 2006 (P. Durville, T. Mulochau).

Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Demersal, at depths of 7–100 m. Outside the area, Red Sea, East and South Africa east to New Guinea, north to southern Japan, south to northern New South Wales/Australia.

Conservation. Data deficient in Réunion (DD). Threats: FIT, FIB. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Prionace glauca* (Linnaeus, 1758) – Blue shark; Requin bleu

Taxonomy. First record from Réunion by Compagno (1984a: 2 unnumbered pp); record confirmed by Fricke (1999: 23), based on MHNRUN material.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Marine species. Pelagic, oceanic but may be found close inshore, at depths of 1–350 m. Outside the area, worldwide in tropical and temperate waters.

Conservation. Threatened migrant in Réunion (TM). Threats: FIT, FIB. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Triaenodon obesus* (Rüppell, 1837) – Whitetip reef shark, bluntheaded shark; Requin corail

Taxonomy. First record from Réunion by Compagno (1984a: 2 unnumbered pp).

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Marine species. Found in lagoons and seaward reefs where it is often resting in caves or under coral ledges during the day, or on a sand patch, or in a channel. Outside the area, Red Sea, East and South Africa east to Panama, north to Ryukyu and Ogasawara islands, south to New South Wales/Australia, New Caledonia and Austral Islands.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, FIB. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté nº 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

### Sphyrnidae – Hammerhead sharks

*Sphyrna mokarran* (Rüppell, 1837) – Great hammerhead shark; Grand requin-marteau

Taxonomy. First record from Réunion by Compagno (1984d: 2 unnumbered pp); record confirmed by Fricke (1999: 24–25), based on MHNRUN material. A record from Réunion by Letourneur et al. (2004: 204, underwater observations and photos) was based on a second species of *Sphyrna*, either *S. lewini* (Griffith & Smith, 1834) or *S. zygaena* (Linnaeus, 1758).

Distribution. Réunion, Mauritius, Madagascar. Marine species. Pelagic, semi-oceanic, found close inshore and well offshore, including reef passes and lagoons, at depths of 1–300 m. Outside the area, worldwide in tropical and warm temperate seas.

Conservation. Threatened migrant in Réunion (TM). Threats: FIT, FIB. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté nº 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

### Dalatiidae – Sleeper sharks

*Centroscymnus crepidater* (Barbosa Bocage & Brito Capello, 1864) – Longnose velvet dogfish; Pailona à long nez

Taxonomy. First record from Réunion by Fricke (1999: 25), based on MNHN and MHNRUN material.

Distribution. Réunion, Aldabra. Marine species. Bathydemersal on the slope, at depths of 230–1500 m. Outside the area, worldwide in tropical and warm temperate seas.

Conservation. Data deficient in Réunion (DD). Threats: FIT, FIB. Sensitive to human activities. Decline unknown. Low priority for conservation action.

*Euprotomicrus bispinatus* (Quoy & Gaimard, 1824) – Pygmy shark; Squale pygmée

Taxonomy. First record from Réunion by Compagno (1984e: 90–91); previously listed by Bleeker (1874: 68), under the name *E. Labordii*.

Distribution. Réunion, Mauritius. Marine species. Epi-, meso-, and bathypelagic, migrating vertically, occurring near the surface at night, at depths of 0–1800 m. Outside the area, worldwide in temperate seas, rarely tropical seas.

Conservation. Data deficient in Réunion (DD). Threats: FIT, FIB. Sensitive to human activities. Decline unknown. Low priority for conservation action.

### Hexanchidae – Cow sharks

*Heptranchias perlo* (Bonnaterre, 1788) – Sharpnose sevengill shark
Taxonomy. First record from Réunion by Letourneur et al. (2004: 204).
Distribution. Réunion, Aldabra, Seychelles. Marine species. Bathydemersal, at depths of 0–1000 m. Outside the area, circumglobal in tropical and warm temperate seas.
Conservation. Data deficient in Réunion (DD). Threats: FIT, FIB. Sensitive to human activities. Keystone species. Decline unknown. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Hexanchus nakamurai* Teng, 1962 – Bigeye sixgill shark; Griset (Réunion), requin vache (France)
Taxonomy. **New record** from Réunion; previously listed by Fricke (1999: 12) as *H. vitulus*, by Guichenot (1863: C31), Letourneur et al. (2004: 204) and others as *H. griseus* (non Bonnaterre, 1788). Taxonomic decision of Compagno (2003: 376).
Distribution. Réunion, Mauritius. Marine species. Found on continental and insular shelves and upper slopes, at depths of 90–600 m, usually on or near bottom, may move to the surface at night. Outside the area, circumglobal in tropical and warm temperate seas.
Conservation. Data deficient in Réunion (DD). Threats: FIT, FIB. Sensitive to human activities. Keystone species. Decline unknown. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.
Remarks. A second species of *Hexanchus* was observed in Réunion, but was not identified to the species level.

### Rhincodontidae – Whale sharks

*Rhincodon typus* (Smith, 1828) – Whale shark; Requin baleine
Taxonomy. First record from Réunion by Compagno (1984c: 2 unnumbered pp).
Distribution. Réunion, Mauritius, Seychelles. Marine species. Pelagic, at depths of 0–700 m. Rare. Outside the area, worldwide in tropical seas.
Conservation. Endangered in Réunion (EN). Threats: FIB. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action. Listed on CMS Appendix II (Anonymus 2004). Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

### Ginglymostomatidae – Nurse sharks

*Nebrius ferrugineus* (Lesson, 1831) – Tawny nurse shark; Requin-nourice fauve
Taxonomy. First record from Réunion by Fricke (1999: 14), based on MNHN material.
Distribution. Réunion, Mauritius. Marine species. Found on or near the bottom in lagoons or along the outer edges of coral and rocky reefs, sandy areas near reefs and off sandy beaches, at depths of 1–70 m. Outside the area, South Africa, Red Sea and islands in western Indian Ocean east to Society Islands, north to southern Japan, south to northern Australia and New Caledonia.
Conservation. Vulnerable in Réunion (VU). Threats: FIT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

### Centrophoridae – Gulper sharks

*Centrophorus moluccensis* Bleeker, 1860 – Smallfin gulper shark
Taxonomy. First record from Réunion by Ribes-Beaudemoulin et al. (2002) and Letourneur et al. (2004: 204).
Distribution. Réunion. Marine species. Bathydemersal, at depths of 125–823 m. Outside the area, East and South Africa east to Philippines and Vanuatu, north to southern Japan, south to northern Australia and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: FIT, FIB. Sensitive to human activities. Decline unknown. Low priority for conservation action.

### Squalidae – Dogfish sharks

*Cirrhigaleus asper* (Merrett, 1973) – Roughskin spurdog; Aiguillat à peau rugueuse
Taxonomy. First record from Réunion as *Squalus asper* by Fricke (1999: 26), based on MHNRUN material. Taxonomic decision of Compagno (1999: 472).
Distribution. Réunion, Comores, Aldabra. Marine species. Bathydemersal on the upper slope, at depths of 200–650 m. Outside the area, western Atlantic from North Carolina/USA to northern Gulf of Mexico; South Africa and Mozambique to western Indian Ocean; Hawaiian Islands.
Conservation. Data deficient in Réunion (DD). Threats: FIT, FIB. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Squalus megalops* (Macleay, 1881) – Bluntnose spiny dogfish; Requin aiguillat (Réunion), aiguillat nez court (France)
Taxonomy. First record from Réunion by Fricke (1999: 27), based on MHNRUN material; previously listed as *Acanthias vulgaris* (non Risso, 1827) by Guichenot (1863: C31), and as *Squalus fernandinus* (non Molina, 1782) by Blanc & Postel (1958: 367, 370).
Distribution. Réunion, Mauritius, Madagascar. Marine species. Demersal, at depths of 30–750 m. Outside the area, in tropical and temperate areas, discontinuous: southeastern Atlantic, South and East Africa, around southern Australia, New Caledonia and Solomon Islands, Vietnam to Korea and southern Japan.
Conservation. Near threatened in Réunion (NT). Threats: FIT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action. Proposed for Annexes II and V of the EU Habitats Directive.

### Pristidae – Sawfishes

*Pristis microdon* Latham, 1794 – Smalltooth sawfish; Requinscie
Taxonomy. First record from Réunion by Fricke (1999: 28); previously listed by Guichenot (1863: C31) as *P. antiquorum* (non Latham, 1794).
Distribution. Réunion, Mauritius, Madagascar. Freshwater, transitional water and marine. Found on sand or mud bottoms of shallow coastal waters, estuaries, river mouths, and

freshwater rivers, at depths of 0–10 m. Outside the area, worldwide in tropical and warm temperate seas.
Conservation. Extinct in Réunion (RE), see LETOURNEUR et al. (2004: 208). Threats: FIT, FIB, CON, HAB. Very sensitive to human activities. Keystone species. High priority for conservation action.

*Pristis pectinata* Latham, 1794 – Largetooth sawfish; Requinscie
Taxonomy. First record from Réunion by FRICKE (1999: 28), based on MNHN material.
Distribution. Réunion, Mauritius. Freshwater, transitional water and marine. Found on sand or mud bottoms of shallow coastal waters, estuaries, river mouths, and freshwater rivers, at depths of 0–10 m. Outside the area, worldwide in tropical and warm temperate seas.
Conservation. Extinct in Réunion (RE), see LETOURNEUR et al. (2004: 208). Threats: FIT, FIB, CON, HAB. Very sensitive to human activities. Keystone species. High priority for conservation action.

### Torpedinidae – Electric rays

*Torpedo fuscomaculata* Peters, 1855 – Black-spotted electric ray; Trembleur (Réunion)
Taxonomy. First record from Réunion by FRICKE (1999: 29), based on MNHN material; previously listed by GUICHENOT (1863: C31) as *T. marmorata* (non Risso, 1810), and by BLEEKER (1866a: 171–173) as *Narcarion polleni*.
Distribution. Réunion, Mauritius, Madagascar, Seychelles, Cargados Carajos. Transitional water and marine. Found on sand near rocky or coral reefs, and in estuaries, at depths of 0–439 m. Outside the area, South Africa (23°S) and islands in western Indian Ocean east to India and Sri Lanka.
Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT, HAB. Sensitive to human activities. Decline unknown. Low priority for conservation action.

### Rhinobatidae – Guitarfish

*Rhynchobatus djiddensis* (Forsskål in Niebuhr, 1775) – Giant guitarfish; Raie guitarre (Réunion), poissons paie à pois (France)
Taxonomy. First record from Réunion by FRICKE (1999: 30), based on MNHN material.
Distribution. Réunion. Freshwater, transitional water and marine. Found inshore and in shallow estuaries, over soft bottom, at depths of 1–50 m. Outside the area, Red Sea, East and South Africa east to Mariana Islands and Samoa, south to northern New South Wales/Australia and New Caledonia.
Conservation. Critically endangered in Réunion (CR). Threats: FIT, FIB, CON, HAB. Sensitive to human activities. Keystone species. Severe decline. High priority for conservation action.

### Dasyatidae – Stingrays

*Dasyatis thetidis* Ogilby in Waite, 1899 – Thorntail stingray
Taxonomy. First record from Réunion and the Mascarenes by FRICKE (1999: 31), based on MNHRUN material; previously listed by GUICHENOT (1863: C31) as *Trygon pastinaca* (non Linnaeus, 1758), and by BLEEKER (1874: 68) as *Leiobatis (Trygon) pastinaca* (non Linnaeus, 1758).
Distribution. Réunion. Freshwater, transitional water and marine. Found in estuaries, lagoons, and around reefs, at depths of 0–440 m. Outside the area, South and East Africa, southern Australia and New Zealand to Lord Howe and Norfolk islands.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, FIB. Sensitive to human activities. Significant decline. Low priority for conservation action.
Remark. A second species of *Dasyatis* was observed in Réunion, but was not identified to the species level.

*Pteryplatytrygon violacea* (Bonaparte, 1832) – Pelagic stingray; Pastenague violette
Taxonomy. First record from Réunion by LETOURNEUR et al. (2004: 204) as *Dasyatis violacea*.
Distribution. Réunion, Mauritius. Marine species. Pelagic near reefs, at depths of 0–100 m. Outside the area, worldwide in tropical and warm temperate waters.
Conservation. Threatened migrant in Réunion (TM). Threats: FIT, FIB, HAB. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Taeniura meyeni* Müller & Henle, 1841 – Black ribbontail ray; Raie noir (Réunion), pastenague éventail (France)
Taxonomy. Recorded from Réunion by FRICKE (1999: 32) under the names *T. meyeni* and *T. melanospilos*, based on MHNRUN material. Taxonomic decision of COMPAGNO (1999: 497).
Distribution. Réunion, Rodrigues. Marine species. Found on sand and reef habitats, at depths of 2–500 m. Outside the area, Red Sea, East and South Africa east to Marquesas Islands, north to southern Japan and Ogasawara Islands, south to Queensland/Australia, Lord Howe and Norfolk islands.
Conservation. Data deficient in Réunion (DD). Threats: FIT, FIB, HAB. Sensitive to human activities. Decline unknown. Low priority for conservation action.

### Myliobatidae – Mantas, eagle rays

*Aetobatus narinari* (Euphrasen, 1790) – Spotted eagle ray; Aigle de mer léopard
Taxonomy. First record from Réunion by GUICHENOT (1863: C31) as *Aetobatis narinari*; record confirmed by FRICKE (1999: 33), based on MHNRUN material.
Distribution. Réunion, Mauritius, Madagascar, Seychelles. Transitional water and marine. Benthopelagic near reefs, also entering estuaries, at depths of 0–80 m. Outside the area, worldwide in tropical and warm temperate coastal seas.
Conservation. Threatened migrant in Réunion (TM). Threats: FIB. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Manta birostris* (Walbaum, 1792) – Giant manta; Mante, diable de mer
Taxonomy. First record from Réunion by FRICKE (1999: 33), based on MNHN material.
Distribution. Réunion, Mauritius. Marine species. Pelagic near reefs, at depths of 0–120 m. Outside the area, worldwide in tropical and warm temperate seas.
Conservation. Threatened migrant in Réunion (TM). Threats: FIB. Rare. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Mobula tarapacana* (Philippi, 1892) – Manta; Mante
Taxonomy. **New record** from Réunion; previously listed by FRICKE (1999: 33) as *M. diabolus* (non Shaw, 1804).
Distribution. Réunion, Mauritius. Marine species. Pelagic, often

near reefs, at depths of 0–30 m. Outside the area, worldwide in tropical seas.
Conservation. Threatened migrant in Réunion (TM). Threats: FIB. Rare. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Myliobatis aquila* (Linnaeus, 1758) – Common eagle ray; Aigle de mer commun
Taxonomy. First record from Réunion by Guichenot (1863: C31).
Distribution. Réunion, Mauritius. Transitional water and marine. Benthopelagic, also in shallow lagoons, bays and estuaries, at depths of 0–300 m. Outside the area, Mediterranean Sea and eastern Atlantic from British Isles to South Africa.
Conservation. Threatened migrant in Réunion (TM). Threats: FIB. Rare. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

### Elopidae – Tenpounders, ladyfishes

*Elops machnata* (Forsskål in Niebuhr, 1775) – Tenpounder, ladyfish; Lubine (Réunion), tarpon grande écaille (France)
Taxonomy. First record from Réunion by Whitehead (1984a: 2 unnumbered pp.); previously listed by Guichenot (1863: C29) as *E. saurus* (non Linné, 1766).
Distribution. Réunion, Mauritius, Madagascar, Seychelles. Transitional water and marine. Found in shallow coastal waters, and enters lagoons and estuaries. Outside the area, Red Sea, East and South Africa east to Philippines.
Conservation. Extinct in Réunion (RE), see Letourneur et al. (2004: 208). Threats: FIT, FIB, HAB, CON. Sensitive to human activities. Keystone species. High priority for conservation action. Restoration of the habitat and reintroduction may be considered.

### Megalopidae – Tarpons

*Megalops cyprinoides* (Broussonet, 1782) – Oxeye tarpon; Tarpon indo-pacifique
Taxonomy. First record from Réunion by Whitehead (1984b: 2 unnumbered pp.); record confirmed by Fricke (1999: 34–35), based on MHNRUN material.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Freshwater, transitional water and marine. Benthopelagic; adults are found at sea, but juveniles inhabit river mouths and freshwater. Outside the area, Red Sea, East and South Africa east to Mariana, Tuamotu and Marquesas islands, north to southern Korea, south to New South Wales/Australia at 36°12'S, New Caledonia and Austral Islands.
Conservation. Extinct in Réunion (RE), according to Letourneur et al. (2004: 208). Threats: FIT, FIB, HAB, CON. Sensitive to human activities. High priority for conservation action. Restoration of the habitat and reintroduction may be considered.

### Albulidae – Bonefishes

*Albula glossodonta* (Forsskål in Niebuhr, 1775) – Indo-Pacific bonefish; Banane (Réunion)
Taxonomy. First record from Réunion by Fricke (1999: 35–36), based on MHNRUN and MNHN material; previously listed by Guichenot (1863: C29) as *A. bananus*, and by Blanc & Postel (1958: 367, 370) as *A. vulpes* (non Linnaeus, 1758).
Distribution. Réunion, Mauritius, Madagascar, Seychelles. Transitional water and marine. Benthopelagic over shallow soft bottoms, also entering estuaries. Outside the area, Red Sea and East Africa east to Hawaiian Islands, north to southern Japan and Ogasawara Islands, south to Lord Howe Island.
Conservation. Endangered in Réunion (EN). Threats: FIT, FIB, HAB, CON. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Albula oligolepis* Hidaka, Iwatsuki & Randall, 2008 – Small-scale bonefish; Banane (Réunion)
Taxonomy. Original description in part from Réunion by Hidaka et al. (2008: 59–60), based on MNHN material.
Distribution. Réunion. Transitional water and marine. Benthopelagic over shallow soft bottoms, also entering estuaries. Outside the area, East and South Africa east to western Thailand and southeastern Australia.
Conservation. Data deficient in Réunion (DD). Threats: FIT, FIB, HAB, CON. Rare. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

### Anguillidae – Freshwater eels

*Anguilla bicolor* McClelland, 1844 – Shortfin eel; Z'anguille, z'amab (Réunion), anguille à nageoire courte (France)
Taxonomy. First record from Réunion by Ege (1939: 151–158) as *A. bicolor bicolor*; record confirmed by Fricke (1999: 37), based on MHNRUN and ZMUC material. Taxonomic decision of the present paper.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Freshwater, transitional water and marine. Anadromous migration; spawning in the ocean, but spending most of their life in rivers. Outside the area, South and East African watersheds and islands of western Indian Ocean east to India and Sri Lanka.
Conservation. Critically endangered in Réunion (CR). Threats: FIT, FIB, HAB, CON, PAR. Very sensitive to human activities. Keystone species. Severe decline. Though adults of this long-lived species may still be reasonably common in parts of its distribution range, the number of arriving postlarvae is severely declining; the species is critically endangered throughout its range. High priority for conservation action.

*Anguilla labiata* (Peters, 1852) – African mottled eel; Z'anguille, z'amab (Réunion), anguille marbrée africaine (France)
Taxonomy. First record from Réunion by Marquet et al. (1997: 29) as *A. nebulosa labiata*; listed by Fricke (1999: 37) as *A. bengalensis labiata*. Actual presence needs verification according to Keith et al. (1999: 72–73). Taxonomic decision of the present paper.
Distribution. Réunion, Mauritius. Freshwater, transitional water and marine. Anadromous migration; spawning in the ocean, but spending most of their life in rivers. Outside the area, South and East African watersheds and adjacent waters of Indian Ocean.
Conservation. Critically endangered in Réunion (CR). Threats: FIT, FIB, HAB, CON, PAR. Very sensitive to human activities. Keystone species. Severe decline. Though adults of this long-lived species may still be reasonably common in parts of its distribution range, the number of arriving postlarvae is severely declining; the species is critically endangered throughout its range. High priority for conservation action.

*Anguilla marmorata* Quoy & Gaimard, 1824 – Giant mottled eel; Z'anguille, z'amab (Réunion), grande anguille marbrée (France)

Taxonomy. First record from Réunion by Guichenot (1863: C30); recorded by Blanc & Postel (1958: 373) as *A. mauritiana*; record confirmed by Fricke (1999: 37–38), based on MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar. Freshwater, transitional water and marine. Anadromous migration; spawning in the ocean, but spending most of their life in rivers. Outside the area, South and East African watersheds and adjacent oceanic waters east to Caroline, Mariana and Marquesas islands, north to southern Japan, south to South Australia and New Caledonia.

Conservation. Critically endangered in Réunion (CR). Threats: FIT, FIB, HAB, CON, PAR. Very sensitive to human activities. Keystone species. Severe decline. Though adults of this long-lived species may still be reasonably common in parts of its distribution range, the number of arriving postlarvae is severely declining; the species is critically endangered throughout its range. High priority for conservation action.

*Anguilla mossambica* (Peters, 1852) – African longfin eel; Z'anguille, z'amab (Réunion), anguille à longue nageoire, anguille de Mozambique (France)

Taxonomy. First record from Réunion by Ege (1939: 89–151); record confirmed by Fricke (1999: 38), based on MNHN material.

Distribution. Réunion, Mauritius, Madagascar. Freshwater, transitional water and marine. Anadromous migration; spawning in the ocean, but spending most of their life in rivers. Outside the area, South and East African watersheds and adjacent oceanic waters.

Conservation. Critically endangered in Réunion (CR). Threats: FIT, FIB, HAB, CON, PAR. Very sensitive to human activities. Keystone species. Severe decline. Though adults of this long-lived species may still be reasonably common in parts of its distribution range, the number of arriving postlarvae is severely declining; the species is critically endangered throughout its range. High priority for conservation action.

## Moringuidae – Spaghetti eels

*Moringua ferruginea* Bliss, 1883 – Rusty spaghetti eel

Taxonomy. First record from Réunion by Fricke (1999: 38–39), based on SMNS material.

Distribution. Réunion, Rodrigues. Marine species. Burying in sand, at depths of 0–40 m. Outside the area, East Africa east to Hawaiian and Easter islands, north to Ryukyu Islands, south to Western Australia at 32°S, southern Great Barrier Reef/Australia at 23°30'S, and New Caledonia.

Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitive to human activities. Decline unknown. Low priority for conservation action.

*Moringua javanica* (Kaup, 1856) – Java spaghetti eel

Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 88); record confirmed by Fricke (1999: 39), based on SMNS material.

Distribution. Réunion, Rodrigues. Marine species. Burying in sand, at depths of 0–15 m. Outside the area, East Africa (south to southern Mozambique) east to Mariana and Marquesas islands, north to Ryukyu Islands, south to New Caledonia and Loyalty Islands.

Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitive to human activities. Decline unknown. Low priority for conservation action.

## Chlopsidae – False morays

*Kaupichthys hyoproroides* (Strömmann, 1896) – Plain false moray, common false moray

Taxonomy. First record from Réunion by Quéro & Saldanha (1995: 64); previously listed by Harmelin-Vivien (1976: 88) as *K. diodontus* (non Schultz, 1943); record confirmed by Fricke (1999: 39–40), based on BPBM material.

Distribution. Réunion, Mauritius, Cargados Carajos. Marine species. Benthic, in holes and crevices of coral or rocky reefs, at depths of 1–95 m. Outside the area, widespread in the western Indian Ocean, central and North Pacific and West Atlantic; in the Indo-Pacific, Natal/South Africa and East Africa east to Hawaiian and Marquesas islands, north to Ryukyu Islands, south to Western Australia and New Caledonia.

Conservation. Data deficient in Réunion (DD). Threats: EUT, HAB. Sensitive to human activities. Decline unknown. Low priority for conservation action.

## Muraenidae – Moray eels

*Anarchias seychellensis* Smith, 1962 – Seychelles moray, marbled reef-eel

Taxonomy. First record from Réunion and the Mascarenes by Fricke (1999: 42), based on SMNS material.

Distribution. Réunion. Marine species. Found among rubble, coralline algal debris, and coral heads of shallow wave-washed reefs, at depths of 0–35 m. Outside the area, East and South Africa east to Hawaiian and Easter islands, north to Ogasawara Islands, south to Western Australia, New Caledonia and Kermadec Islands.

Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT, HAB. Rare. Sensitive to human activities. Decline unknown. Low priority for conservation action.

**Channomuraena bauchotae* Saldanha & Quéro, 1994 – Réunion broadbanded moray; Murène anneau de Réunion

Taxonomy. Original description from Réunion by Saldanha & Quéro (1994: 308–312); listed by Fricke (1999: 41, part) as *C. bennettii*, based on MNHN material. Taxonomic decision of Böhlke & Smith (2002: 157).

Distribution. Réunion. Marine species. Benthic, in holes and crevices of rocky reefs. Endemic to Réunion.

Conservation. Data deficient in Réunion (DD). Threats: FIT. Global importance. Rare. Sensitive to human activities. Decline unknown. Low priority for conservation action.

*Echidna nebulosa* (Ahl, 1789) – Snowflake moray, floral moray; Murène étoilée

Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 88); record confirmed by Fricke (1999: 41–42), based on LEMUR, MHNRUN, MNHN and USNM material.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Marine species. Found on the reef flat and in coral reefs, often resting during the day under pieces of dead coral, at depths of 0–48 m. Outside the area, Red Sea, East and South Africa east to Panama, north to Ryukyu and Ogasawara islands, Johnston Atoll and Hawaiian Islands, south to Western Australia at 22°42'S and New Caledonia.

Conservation. Data deficient in Réunion (DD). Threats: FIT,

EUT, HAB. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Echidna polyzona* (Richardson, 1845) – Barred moray; Congre noir (Réunion)

Taxonomy. First record from Réunion by FOURMANOIR & GUÉZÉ (1961b: 6); record confirmed by FRICKE (1999: 42), based on SMNS material.

Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Benthic on reef flats, clear shallow lagoons, and seaward reefs, at depths of 0–10 m. Outside the area, Red Sea, East Africa and Natal/South Africa east to Hawaiian and Marquesas islands, north to Ryukyu Islands and Minami Tori Shima, south to Western Australia.

Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT, HAB. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Enchelycore pardalis* (Temminck & Schlegel, 1846) – Dragon moray, leopard moray

Taxonomy. First record from Réunion by HARMELIN-VIVIEN (1976: 88). A record of *E. bayeri* (Schultz in Schultz, Herald, Lachner, Welander & Woods, 1953) from Réunion by LETOURNEUR et al. (2004: 208) needs verification.

Distribution. Réunion, Mauritius, Madagascar, Aldabra. Marine species. Found in holes and crevices of rocky and coral reefs, at depths of 1–60 m. Outside the area, Chagos Archipelago east to Hawaiian, Line and Marquesas islands, north to southern Korea, southern Japan and Ogasawara Islands, south to New Caledonia.

Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT, HAB. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Enchelynassa canina* (Quoy & Gaimard, 1824) – Viper moray

Taxonomy. First record from Réunion by RIBES-BEAUDEMOULIN et al. (2002) and LETOURNEUR et al. (2004: 204).

Distribution. Réunion. Marine species. Found in areas with strong surge such as benches, outer coral reef flats and coral reef fronts, at depths of 1–30 m. Outside the area, Chagos Archipelago east to Panama.

Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT, HAB. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Gymnomuraena zebra* (Shaw in Shaw & Nodder, 1797) – Zebra moray; Murène zébrée

Taxonomy. First record from Réunion by LETOURNEUR (1992: unpag. 1); record confirmed by FRICKE (1999: 43), based on visual record.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Marine species. Secretive on sandy and rocky bottoms, crevices and ledges of seaward coral reefs, at depths of 1–50 m. Outside the area, East Africa east to Galapagos Archipelago, north to Ryukyu and Ogasawara islands, south to North West Cape/Western Australia and New Caledonia.

Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT, HAB. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Gymnothorax buroensis* (Bleeker, 1857) – Latticetail moray, vagrant moray; Murène errant

Taxonomy. First record from Réunion by LETOURNEUR (1992: unpag. 1); record confirmed by FRICKE (1999: 44), based on SMNS material.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles, Cargados Carajos. Marine species. Secretive in shallow lagoon and seaward reefs, between coralline rocks and corals, at depths of 0–25 m. Outside the area, Red Sea, East Africa and Natal/South Africa east to Panama, north to Ryukyu and Hawaiian islands, south to Western Australia at 17°30'S and New Caledonia.

Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT, HAB. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Gymnothorax chilospilus* Bleeker, 1864 – Lip-spot moray

Taxonomy. First record from Réunion and the Mascarenes by FRICKE (1999: 44), based on SMNS and USNM material.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles, Cargados Carajos. Marine species. Found on shallow coastal coral reef flats and in tidal pools, occasionally also in deep rubble reefs, at depths of 0–45 m. Outside the area, Oman, East and South Africa east to Hawaiian and Society islands, and Rapa, north to Ryukyu and Ogasawara islands, south to Western Australia and Norfolk Island.

Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT, HAB. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Gymnothorax elegans* Bliss, 1883 – Elegant moray; Congre jaune (Réunion)

Taxonomy. First record from Réunion by QUÉRO & SALDANHA (1995: 66); previously described from Réunion by KAUP (1856c: 67) under the name *Muraena flavimarginata*, preoccupied by *M. flavimarginata* Rüppell, 1830; record confirmed by FRICKE (1999: 44–45), based on MNHN material.

Distribution. Réunion, Mauritius, Madagascar. Marine species. Found in crevices of steep drop-offs, and in deep water, at depths of 25–450 m. Outside the area, Red Sea and East Africa east to Samoa, north to Ogasawara Islands.

Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Gymnothorax enigmaticus* McCosker & Randall, 1982 – Tiger moray, enigmatic moray

Taxonomy. First record from Réunion by QUÉRO & SALDANHA (1995: 66); record confirmed by FRICKE (1999: 45), based on MNHN material.

Distribution. Réunion, Mauritius, Madagascar, Aldabra. Marine species. Found in shallow coastal coral reefs; juveniles inhabit lagoons, at depths of 0–3 m, occasionally down to 24 m. Outside the area, Gulf of Aden, east Africa and Natal/South Africa east to Tuamotu Archipelago, north to Ryukyu Islands, south to Samoa.

Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT, HAB. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Gymnothorax eurostus* (Abbott, 1860) – Salt-and-pepper moray, stout moray

Taxonomy. First record from Réunion by QUÉRO & SALDANHA (1995: 66); previously listed by HARMELIN-VIVIEN (1976: 88) as *Lycodontis laysanus*; record confirmed by FRICKE (1999: 45–46), based on SMNS and USNM material.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Cargados Carajos. Marine species. Found in holes and crevices of the coral reef, juveniles in tidal pools; at depths of 0–74 m. Outside the area, Antiequatorial, Transkei/South Africa east to Cocos Island, north to Ryukyu and Ogasawara islands, Minami Tori Shima, and Hawaiian, Marquesas and Easter islands, south to Shark Bay/Western Australia, Lord Howe, Kermadec and Austral islands.

Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT, HAB. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Gymnothorax favagineus* Bloch & Schneider, 1801 – Honeycomb moray, laced moray
Taxonomy. First record from Réunion by Fricke (1999: 46), based on an underwater photograph taken by A. Diringer.
Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Found in coral reefs, on reef flats and outer reef slopes, at depths of 1–45 m. Outside the area, Red Sea, East and South Africa east to Papua New Guinea, north to southern Japan, south to Western Australia at 20°46'S and Sydney/New South Wales, Australia.
Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT, HAB. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Gymnothorax fimbriatus* (Bennett, 1832) – Fimbriated moray
Taxonomy. First record from Réunion by Letourneur (1998: 282); previously listed by Guichenot (1863: C30) as *Thyrsoidea bullata*; record confirmed by Fricke (1999: 46–47), based on SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles, Cargados Carajos. Marine species. Found on coral reef flats and seaward reefs, prefers protected inshore waters among dead corals, young specimens also in tidal pools; at depths of 0–45 m. Outside the area, east to Mariana, Marquesas and Tuamotu islands, north to Ryukyu and Ogasawara islands, south to Western Australia at 20°30'S, southern Queensland/Australia and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Gymnothorax flavimarginatus* (Rüppell, 1830) – Yellow-edged moray, yellow-margined moray; Congre queue verte, murène à queue verte (Réunion), murène à bord jaune (France)
Taxonomy. First record from Réunion by Bleeker (1874: 72); record confirmed by Fricke (1999: 47), based on LEMUR, SMNS and USNM material.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Aldabra, Seychelles, Cargados Carajos. Marine species. Found in holes and crevices of coral or rocky areas of reef flats and protected shorelines to seaward reefs; large adults in deeper reefs; young specimens in tidal pools; at depths of 0–150 m. Outside the area, Red Sea, East Africa and Transkei/South Africa east to Panama, north to Ryukyu, Ogasawara and Hawaiian islands, south to North West Cape/Western Australia, Queensland/Australia at 24°49'S and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Gymnothorax griseus* (Lacepède [ex Commerson], 1803) – Geometric moray
Taxonomy. First record from Réunion by Kaup (1856a: 64–65) as *Thyrsoidea grisea*; record confirmed by Fricke (1999: 56–58) as *Siderea grisea*, based on LEMUR, MNHN and SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Marine species. Found on coral and rocky reefs and in lagoons, at depths of 0–40 m. Outside the area, Red Sea, East Africa and Transkei/South Africa.
Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Gymnothorax javanicus* (Bleeker, 1859) – Giant moray; Murène javanaise
Taxonomy. First record from Réunion by Fricke (1999: 48), based on an underwater observation in 1998.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles, Cargados Carajos. Marine species. Found in lagoon and seaward reefs; juveniles in the intertidal reef flat; at depths of 0–50 m. Outside the area, Red Sea, East Africa and Mozambique Channel east to Hawaiian Islands, Pitcairn Group and Cocos Island, north to Ryukyu and Ogasawara islands, south to Western Australia and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT, HAB. Rare. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Gymnothorax johnsoni* (Smith, 1962) – White-spotted moray; Congre tacheté (Réunion)
Taxonomy. First record from Réunion by Quéro & Saldanha (1995: 67); previously listed by Fourmanoir & Guézé (1961b: 7) as *Lycodontis punctatus* (non Bloch & Schneider, 1801); record confirmed by Fricke (1999: 48–49), based on SMNS material.
Distribution. Réunion, Mauritius, Madagascar. Marine species. Found in crevices of coral and rocky reefs; young specimens in tidal pools; at depths of 0–110 m. Outside the area, East and South Africa.
Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Gymnothorax margaritophorus* Bleeker, 1865 – Trunk-eyed moray, blotch-necked moray
Taxonomy. First record from Réunion by Quéro & Saldanha (1995: 67); record confirmed by Fricke (1999: 49), based on SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Aldabra, Seychelles, Cargados Carajos. Marine species. Found on coral reef flats and outer reef slopes, juveniles in shallow reef areas; secretive, at depths of 1–25 m. Outside the area, Transkei/South Africa and East Africa east to Line Islands, north to Ryukyu and Ogasawara islands, south to Western Australia, southern Queensland/Australia at 23°30'S and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT, HAB. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Gymnothorax meleagris* (Shaw in Shaw & Nodder, 1795) – Whitemouth moray, Turkey moray; Congre pintade (Réunion), murène voie lactée (France)
Taxonomy. First record from Réunion by Biais & Taquet (1992: 75) as *Lycodontis meleagris*, and by Letourneur (1992: unpag. 1); record confirmed by Fricke (1999: 50–51), based on LEMUR, MHNRUN and SMNS material.
Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Found in holes and crevices of coral-rich areas of lagoon and seaward reefs, young specimens in tidal pools; at depths of 0–51 m. Outside the area, Red Sea, East Africa and Algoa Bay/South Africa east to Hawaiian Islands and Pitcairn Group, north to southern Japan, Ogasawara Islands and Minami Tori Shima, south to Lord Howe and Austral islands.

Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT, HAB. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Gymnothorax nudivomer* (Günther in Playfair & Günther, 1867) – Yellowmouth moray, starry moray; Congre tacheté (Réunion)

Taxonomy. First record from Réunion by Fourmanoir & Guézé (1961b: 7–8) as *Lycodontis nudivomer*.

Distribution. Réunion, Mauritius, Seychelles. Marine species. Found in holes and crevices of coral reefs, at depths of 2–271 m. Outside the area, Red Sea, East Africa and Natal/South Africa east to Hawaiian Islands, north to southern Japan, south to Queensland/Australia at 23°30'S and New Caledonia.

Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT, HAB. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Gymnothorax pictus* (Ahl, 1789) – Peppered moray, paintspotted moray; Congre (Réunion), murène sidérale (France)

Taxonomy. First record from Réunion by Bleeker (1874: 73); also listed by Guichenot (1863: C30) as *Siderea pantherina* and *Poecilophis variegatus*.

Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Found on coral and rocky reefs, young specimens in tidal pools; at depths of 0–100 m. Outside the area, central Red Sea, East Africa and Natal/South Africa east to Panama, north to Ryukyu Islands and Minami Tori Shima, south to North West Cape/Western Australia, Queensland/Australia to 23°30'S and New Caledonia.

Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Gymnothorax pikei* Bliss [ex Steindachner], 1883 – Pike's moray

Taxonomy. **New record** from Réunion, based on a photographed specimen collected by local fishermen, off Saint-Paul, at 250 m depth, in 2008 (P. Durville, E. Tessier, T. Mulochau).

Distribution. Réunion, Mauritius. Marine species. Found on deep reefs. Endemic to the western Mascarenes.

Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Regional importance. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Gymnothorax rueppellii* (McClelland, 1844) – Banded moray, yellow-headed moray

Taxonomy. First record from Réunion by Quéro & Saldanha (1995: 67); previously listed by Chabanaud in Rigotard (1925: 395) as *G. punctato-fasciatus* (non Bleeker, 1863), Harmelin-Vivien (1976: 88) as *Lycodontis petelli*, and Harmelin-Vivien (1976: 88) as *Echidna zebra* (non Shaw in Shaw & Nodder, 1797); record confirmed by Fricke (1999: 52–53), based on LEMUR, MHNRUN, MNHN, SMNS and USNM material.

Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Found in holes and crevices of coral reefs, young specimens in shallow water and tidal pools; at depths of 0–40 m. Outside the area, Red Sea and East Africa (south to Bazaruto/Mozambique) east to Hawaiian Islands, north to Ryukyu Islands, south to Western Australia and Loyalty Islands.

Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT, HAB. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Gymnothorax undulatus* (Lacepède [ex Commerson], 1803) – Undulated moray, leopard moray; Murène ondulante

Taxonomy. First record from Réunion by Fourmanoir & Guézé (1961b: 7, 8) as *Lycodontis undulatus*; record confirmed by Fricke (1999: 54–55), based on LEMUR and SMNS material.

Distribution. Réunion, Mauritius, Rodrigues, Walters Shoal, Madagascar, Aldabra, Seychelles, Cargados Carajos. Marine species. Found in holes and crevices of coral and rocky reefs, on reef flats among rocks, rubble, or debris and also occurs in lagoons and seaward reefs, young specimens in shallow water and tidal pools; at depths of 0–26 m. Outside the area, Red Sea, East Africa and Port Alfred/South Africa east to Panama, north to southern Japan, Ogasawara, Hawaiian and Gambier islands, south to Western Australia at 28°54'S, New South Wales/Australia and New Caledonia.

Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Sensitive to human activities. Keystone species. Decline unknown. Medium priority for conservation action.

*Gymnothorax zonipectis* Seale, 1906 – Bar-tailed moray

Taxonomy. First record from Réunion by Letourneur (1992: 83).

Distribution. Réunion, Mauritius, Aldabra, Seychelles. Marine species. Found in coral and rocky reefs, in ledges and rubble areas of outer reef slopes, secretive during the day; young specimens in shallow reefs; at depths of 1–40 m. Outside the area, East and South Africa east to Society and Marquesas islands, north to Philippines, south to North West Cape/Western Australia and Great Barrier Reef/Australia at 15°50'S.

Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Rhinomuraena quaesita* Garman, 1888 – Ribbon eel

Taxonomy. First record from Réunion by Letourneur (1998: 282).

Distribution. Réunion, Mauritius, Seychelles. Marine species. Found in coral and rocky reefs and lagoons; secretive species normally hidden in sand or rubble; at depths of 1–57 m. Outside the area, East Africa east to Mariana and Tuamotu islands, north to southern Japan and Ogasawara Islands, south to Western Australia, Queensland/Australia to 23°30'S and New Caledonia.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Scuticaria tigrina* (Lesson, 1828) – Tiger reef-eel, tiger snake-moray; Murène tigre récifale

Taxonomy. First record from Réunion by Quéro & Saldanha (1995: 65) as *Uropterygius tigrinus*; record confirmed by Fricke (1999: 56), based on MNHN material.

Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Found on sand in coral reef lagoons and between rocks, at depths of 0–20 m. Outside the area, East Africa and Natal/South Africa east to Panama, north to Kerama and Hawaiian islands, south to New Caledonia.

Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Strophidon sathete* (Hamilton, 1822) – Giant estuarine moray; Murène fil géante

Taxonomy. First record from Réunion by Quéro & Saldanha (1995: 68); previously listed as *Thyrsoidea tile* (non Hamil-

ton, 1822) by Guichenot (1863: C30) as *Muraena Augusti* (non Kaup, 1856) by Bleeker (1874: 72), and as *Thyrsoidea macrura* by Fourmanoir & Guézé (1961b: 9); record confirmed by Fricke (1999: 59) as *T. macrura*, based on MHNRUN material.

Distribution. Réunion, Mauritius, Madagascar. Freshwater, transitional water and marine. Found on mud bottoms and estuarine areas, sometimes in rivers and inner bays, at depths of 1–15 m. Outside the area, Red Sea, East and South Africa east to Mariana and Society islands, north to southern Japan, south to Western Australia, Queensland/Australia and New Caledonia.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, EUT, CON. Rare. Sensitive to human activities. Significant decline. High priority for conservation action. Proposed for Annexes II and V of the EU Habitats Directive.

*Uropterygius concolor* Rüppell, 1838 – Uniform reef-eel, unicolour snake moray

Taxonomy. First record from Réunion by Fourmanoir & Guézé (1961b: 9); previously listed as *U. unicolor* by Guichenot (1863: C30); record confirmed by Fricke (1999: 59), based on MNHN material.

Distribution. Réunion, Mauritius, Madagascar. Transitional water and marine. Found in shallow coral reefs, estuaries and brackish rivers, at depths of 0–8 m. Outside the area, Red Sea, East Africa and Durban/South Africa east to Mariana and Marquesas islands, north to southern Japan, south to North West Cape/Western Australia and Queensland/Australia and New Caledonia.

Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT, CON, HAB. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Uropterygius macrocephalus* (Bleeker, 1864) – Large-headed snake moray, long-headed snake moray

Taxonomy. First record from Réunion by Quéro & Saldanha (1995: 64–65); record confirmed by Fricke (1999: 59–60), based on MNHN material.

Distribution. Réunion, Mauritius. Marine species. Found on exposed coral reefs, at depths of 1–14 m. Outside the area, Christmas Island (eastern Indian Ocean) east to Panama, north to southern Japan and Hawaiian Islands, south to Loyalty Islands.

Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT, HAB. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Uropterygius xanthopterus* Bleeker, 1859 – Freckleface reef eel

Taxonomy. First record from Réunion by Quéro & Saldanha (1995: 65); questionably recorded by Fourmanoir & Guézé (1961b: 9) as *U. marmoratus* (non Lacepède, 1803); record confirmed by Fricke (1999: 60), based on MNHN material.

Distribution. Réunion. Marine species. Found in holes and crevices of shallow coral reefs and drop-offs, at depths of 3–56 m. Outside the area, Sodwana Bay/South Africa and East Africa east to Line, Society and Marquesas islands, north to Mariana and Marshall islands.

Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT, HAB. Sensitive to human activities. Probable decline. Medium priority for conservation action.

### Synaphobranchidae – Cutthroat eels

*Dysomma anguillare* Barnard, 1923 – Shortbelly eel

Taxonomy. First record from Réunion by Durville et al. (submitted), based on MHNRUN material.

Distribution. Réunion. Marine species. Demersal, at depths of 30–270 m. Outside the area, known from scattered localities in the Western Atlantic, East and South Africa, and Japan; probably more widespread.

Conservation. Data deficient in Réunion (DD). Threats: FIB. Sensitivity to human activities unknown. Decline unknown. Low priority for conservation action.

*Meadia abyssalis* (Kamohara, 1938) – Abyssal cutthroat eel

Taxonomy. First record from Réunion by Blache (1975) as *Meadia abyssale*; record confirmed by Fricke (1999: 60–61), based on MNHN material.

Distribution. Réunion, Mauritius. Marine species. Bathydemersal on the slope, at depths of 100–329 m. Outside the area, Mascarenes east to Hancock Seamount, Hawaiian and Society islands, north to southern Japan, south to New Caledonia.

Conservation. Data deficient in Réunion (DD). Threats: FIB. Sensitivity to human activities unknown. Decline unknown. Low priority for conservation action.

*Simenchelys parasitica* Gill in Goode & Bean, 1879 – Snubnosed eel; Anguille à nez court

Taxonomy. **New record** from Réunion, based on a photographed specimen collected by local fishermen, off Saint-Paul, at 450 m depth, in 2007 (P. Durville, T. Mulochau).

Distribution. Réunion. Marine species. Bathydemersal, at depths of 136–2620 m. Outside the area, worldwide in warm temperate oceans except eastern Pacific.

Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitive to human activities. Probable decline. Low priority for conservation action.

*Synaphobranchus affinis* Günther, 1877 – Grey cutthroat eel

Taxonomy. First record from Réunion by Quéro & Saldanha (1995: 72–73); record confirmed by Fricke (1999: 61), based on MNHN material.

Distribution. Réunion. Marine species. Bathydemersal on the slope, at depths of 290–2334 m; the Réunion specimens were collected at depths of 650–800 m, at temperatures of 3.3–11.3 °C (Sulak & Shcherbachev 1997: 1185). Outside the area, worldwide in tropical and temperate oceans.

Conservation. Data deficient in Réunion (DD). Threats: FIB. Sensitivity to human activities unknown. Decline unknown. Low priority for conservation action.

*Synaphobranchus brevidorsalis* Günther, 1887 – Shortdorsal cutthroat eel

Taxonomy. First record from Réunion by Quéro & Saldanha (1995: 73–74); record confirmed by Fricke (1999: 61), based on MNHN material.

Distribution. Réunion. Marine species. Bathydemersal on the slope, at depths of 900–3000 m; the Réunion specimens were collected at depths of 1340–1850 m, at temperatures of 2–11 °C. Outside the area, worldwide in tropical and temperate oceans except eastern North Pacific.

Conservation. Data deficient in Réunion (DD). Threats: FIB. Sensitivity to human activities unknown. Decline unknown. Low priority for conservation action.

### Ophichthidae – Snake eels

*Apterichtus klazingai* (Weber, 1913) – Sharpsnout snake eel

Taxonomy. First record from Réunion by Quéro & Saldanha (1995: 74–75) as *Apterichthys klazingai*; record confirmed by Fricke (1999: 61–62), based on MNHN material.

Distribution. Réunion. Marine species. Found buried on sand or gravel bottoms, at depths of 1–120 m. Outside the area, Durban/South Africa east to Marshall Islands, south to Loyalty Islands.
Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitivity to human activities unknown. Probable decline. Medium priority for conservation action.

*Brachysomophis crocodilinus* (Bennett, 1833) – Crocodile snake eel
Taxonomy. First record from Réunion by Ribes-Beaudemoulin et al. (2002) and Letourneur et al. (2004: 204).
Distribution. Réunion, Mauritius, Rodrigues, Madagascar. Marine species. Found buried in lagoon habitats with sand, rock and broken coral substrates, adjacent to coral reefs, at depths of 0–30 m. Outside the area, East Africa east to Society Islands, north to southern Japan, south to northern Australia.
Conservation. Data deficient in Réunion (DD). Threats: EUT, HAB. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Callechelys marmorata* (Bleeker, 1853) – Marbled snake eel
Taxonomy. Doubtful record from Réunion by Guichenot (1863: C30) as *Pisodonophis maculatus*; record probable but needs verification.
Distribution. Réunion, Mauritius, Madagascar, Aldabra. Marine species. Found buried in gravel or sand, at depths of 2–37 m. Outside the area, Red Sea and East Africa east to Society Islands, north to Taiwan, south to New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitive to human activities. Decline unknown. Low priority for conservation action.

*Leiuranus semicinctus* (Lay & Bennett, 1839) – Half-banded snake eel, saddled snake eel
Taxonomy. First record from Réunion by Fricke (1999: 62–63), based on an underwater observation in 1995.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Marine species. Found in burrows in sandy areas and seagrass beds of both lagoon and seaward reefs, at depths of 0–70 m. Outside the area, Knysna/South Africa and East Africa east to Hawaiian Islands and Pitcairn Group, north to southern Japan, south to Exmouth Gulf/Western Australia and Lord Howe Island.
Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT, HAB. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Myrichthys colubrinus* (Boddaert, 1781) – Ringed snake eel, banded snake eel, harlequin snake eel
Taxonomy. First record from Réunion by Fourmanoir & Guézé (1961b: 10, fig. 4); record confirmed by Fricke (1999: 64–65), based on LEMUR and MHNRUN material.
Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Found on shallow sand flats and seagrass in coral reef lagoons, at depths of 0–1.5 m. Outside the area, Red Sea and East Africa (south to Delagoa Bay/Mozambique) east to Johnston and Tuamotu (but not Hawaiian) islands, north to Ryukyu and Ogasawara islands, south to Western Australia and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT, HAB. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Myrichthys maculosus* (Cuvier, 1816) – Ocellated snake eel, spotted snake eel, tiger snake eel
Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 89); record confirmed by Fricke (1999: 65–66), based on MNHN and SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Aldabra, Cargados Carajos. Marine species. Found buried on sand bottoms of sandy areas of reef flats, lagoons, and seaward reefs, including tidal pools, at depths of 0–30 m. Outside the area, central Red Sea, East Africa and Transkei/South Africa east to Panama (except for Hawaiian Islands), north to southern Japan, Ogasawara and Midway islands, south to Western Australia, Lord Howe and Kermadec islands.
Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT, HAB. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Ophichthus bonaparti* (Kaup, 1856) – Napoleon snake eel, saddled snake eel
Taxonomy. First record from Réunion by Fricke (1999: 66), based on MHNRUN material.
Distribution. Réunion, Mauritius. Marine species. Found buried in sand of lagoons adjacent to coral reefs, at depths of 1–20 m. Outside the area, East and South Africa east to Indonesia and Marshall and Society islands, north to Penghu Islands/Taiwan, south to New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT, HAB. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Ophichthus polyophthalmus* Bleeker, 1864 – Many-eyed snake eel; Congre chabouk (Réunion)
Taxonomy. First record from Réunion by Fourmanoir & Guézé (1961b: 11, fig. 5) as *Ophichthys polyophthalmus*.
Distribution. Réunion, Mauritius. Marine species. Found buried in sand of lagoons adjacent to coral reefs, at depths of 1–20 m. Outside the area, Delagoa Bay/South Africa and East Africa east to Hawaiian and Marquesas islands, north to southern Japan.
Conservation. Data deficient in Réunion (DD). Rare. Threats: FIB, EUT, HAB. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Pisodonophis cancrivorus* (Richardson, 1848) – Longfin snake eel; Serpenton à longue nageoire
Taxonomy. First record from Réunion by Guichenot (1863: C30). The unused *Ophisurus nigrepinnis* described by Liénard (1843: 90–91) is a senior synonym according to Fricke (1999: 67) and needs to be supressed by ICZN.
Distribution. Réunion, Mauritius, Madagascar. Freshwater, transitional water and marine. Found on sand or mud bottoms in lagoons and estuaries, entering lower reaches of rivers. Outside the area, Red Sea, East Africa and Algoa Bay/South Africa east to French Polynesia, north to southern Japan, south to Queensland/Australia.
Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT, CON. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Scolecenchelys gymnota* (Bleeker, 1857) – Slender worm-eel
Taxonomy. First record from Réunion by Quéro & Saldanha (1995: 74) as *Muraenichthys gymnotus*; record confirmed by Fricke (1999: 63) as *M. gymnotus*, based on MNHN and SMNS material. Taxonomic decision of McCosker (2002: 25).
Distribution. Réunion, Madagascar. Marine species. Found buried in sand or gravel of coral reef lagoons and sand patches including tidal pools, at depths of 0–5 m. Outside the area, Red Sea, East and Bredasdorp/South Africa east to Line Is-

lands and Pitcairn Group, north to southern Japan and Johnston Island, south to Western Australia and Loyalty Islands.
Conservation. Data deficient in Réunion (DD). Threats: EUT, HAB. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Scolecenchelys laticaudata* (Ogilby, 1897) – Redfin worm-eel
Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 88) as *Muraenichthys laticaudata*; record confirmed by Fricke (1999: 63) as *M. laticaudatus*, based on SMNS and USNM material. Taxonomic decision of Castle & McCosker (1999: 121).
Distribution. Réunion, Mauritius, Rodrigues, Madagascar. Marine species. Found buried in sand bottoms adjacent to coral reefs, including tidal pools, at depths of 0–26 m. Outside the area, Red Sea, East Africa and East London/South Africa east to Mariana Islands and Pitcairn Group, south to Lord Howe Island.
Conservation. Data deficient in Réunion (DD). Threats: EUT, HAB. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Scolecenchelys xorae* (Smith, 1958) – Orangehead worm-eel
Taxonomy. First record from Réunion by Letourneur (1992: 34, unpag. 1) as *Muraenichthys xorae*. Taxonomic decision of Castle & McCosker (1999: 121).
Distribution. Réunion, Mauritius, southwestern Madagascar. Marine species. Found buried in sand bottoms adjacent to coral and rocky reefs, at depths of 2–26 m. Outside the area, South Africa (Algoa Bay to Natal).
Conservation. Data deficient in Réunion (DD). Threats: EUT, HAB. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Yirrkala tenuis* (Günther, 1870) – Thin sand-eel
Taxonomy. First record from Réunion by Marquet et al. (1997: 29); record confirmed by Fricke (1999: 67), based on MHNRUN material.
Distribution. Réunion, Mauritius. Transitional water and marine. Found buried in sand in coral reef lagoons and estuaries, at depths of 0–5 m. Outside the area, Red Sea and East Africa south to Natal/South Africa.
Conservation. Data deficient in Réunion (DD). Threats: EUT, HAB. Sensitive to human activities. Probable decline. Medium priority for conservation action.

## Colocongridae – Froghead eels

*Coloconger raniceps* Alcock, 1889 – Froghead eel
Taxonomy. First record from Réunion by Quéro & Saldanha (1995: 75–76); record confirmed by Fricke (1999: 68), based on MNHN material.
Distribution. Réunion, Madagascar. Marine species. Bathydemersal on the slope, at depths of 300–1134 m. Outside the area, East Africa east to southern Japan.
Conservation. Data deficient in Réunion (DD). Threats: FIB. Sensitivity to human activities unknown. Decline unknown. Low priority for conservation action.

## Congridae – Conger eels

*Ariosoma mauritianum* (Pappenheim, 1914) – Blunt-tooth conger
Taxonomy. First record from Réunion by Fricke (1999: 68), based on MNHN material.
Distribution. Réunion, Madagascar. Marine species. Bathydemersal on the slope, at depths of 360–800 m. Outside the area, Red Sea, East Africa and Natal/South Africa east to Solomon Islands, south to Western Australia at 32°S and New South Wales/Australia at 33°33'S and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: FIB. Sensitivity to human activities unknown. Decline unknown. Low priority for conservation action.

*Bathycongrus wallacei* (Castle, 1968) – Wallace's conger eel
Taxonomy. First record from Réunion by Quéro & Saldanha (1995: 78) as *Rhechias wallacei*; record confirmed by Fricke (1999: 70–71) as *R. wallacei*, based on MNHN material. Taxonomic decision of Castle & Smith (1999: 993).
Distribution. Réunion. Marine species. Bathydemersal on the slope, at depths of 250–500 m. Outside the area, Natal/South Africa to southern Mozambique, Indonesia and Philippines north to southern Japan, probably more widespread.
Conservation. Data deficient in Réunion (DD). Threats: FIB. Sensitivity to human activities unknown. Decline unknown. Low priority for conservation action.

*Conger cinereus* Klunzinger [ex Rüppell], 1830 – Black-edged conger, moustache conger; Congre oiro
Taxonomy. First record from Réunion by Kanazawa (1958: 234–243) as *C. cinereus cinereus*; previously described as *C. altipinnis* by Kaup (1856a: 72); record confirmed by Fricke (1999: 68–69), based on LEMUR, MNHN, SMNS and USNM material. Authorship as discussed by Fricke (2008: 15, under *Muraenesox cinereus*).
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles, Cargados Carajos. Transitional water and marine. Found in coral reefs and adjacent lagoons and estuaries, young specimens often in tidal pools; at depths of 0–80 m. Outside the area, Red Sea and East Africa east to Hawaiian and Line islands and Pitcairn Group, south to Kimberleys/Western Australia, Lord Howe Island and Rapa.
Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT, HAB. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Conger wilsoni* (Banning in Bloch & Schneider, 1801) – Cape conger
Taxonomy. First record from Réunion by Quéro & Saldanha (1995: 76–78); record confirmed by Fricke (1999: 69–70), based on MNHN material. Identity of original description doubtful; neotype and petition to ICZN necessary or petition to ICZN may be necessary to continue usage of name in Congridae.
Distribution. Réunion, Rodrigues. Transitional water and marine. Found on rocky reefs and adjacent estuaries, young specimens in tidal pools; at depths of 0–30 m. Outside the area, Cape of Good Hope/South Africa to southern Mozambique, southern Australia, New Caledonia, Lord Howe Island and New Zealand east to Kermadec Islands and Tuvalu, possibly Japan.
Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Gorgasia klausewitzi* Quéro & Saldanha, 1995 – Klausewitz's garden eel
Taxonomy. First record from Réunion in original description by Quéro & Saldanha (1995: 80–83, figs. 4–5).
Distribution. Réunion, Mauritius, Comores. Marine species. Found in burrows on sand bottom adjacent to coral reefs, at

depths of 3–25 m. Endemic to volcanic islands in the southwestern Indian Ocean.
Conservation. Data deficient in Réunion (DD). Threats: EUT, HAB. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Heteroconger hassi* (Klausewitz & Eibl-Eibesfeldt, 1959) – Spotted garden eel, Hass's garden eel
Taxonomy. First record from Réunion by Letourneur (1998: 282).
Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Found in burrows on sand bottom adjacent to coral reefs, at depths of 2–45 m. Outside the area, East Africa east to Wake Atoll, Tonga, Samoa and Line Islands, north to Ryukyu and Ogasawara islands, south to northwestern Australia, Queensland/Australia and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: EUT, HAB. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

### Muraenesocidae – Pike congers

*Muraenesox bagio* (Hamilton, 1822) – Common pike conger; Murénésoce commun
Taxonomy. First record from Réunion by Castle (1984: 2 unnumbered pp.); previously described by Fourmanoir & Guézé (1961b: 5–6) as *M. cinereus* (non Forsskål in Niebuhr, 1775).
Distribution. Réunion, Mauritius, Madagascar. Transitional water and marine. Found in coastal waters, including estuaries, at depths of 1–100 m. Outside the area, Durban/South Africa and East Africa east to Samoa, north to southern Yellow Sea, south to Western Australia at 27°42'S, New South Wales/Australia at 34°53'S and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: FIT, CON. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

### Nemichthyidae – Snipe eels

*Nemichthys curvirostris* (Strömmann, 1896) – Boxer snipe eel
Taxonomy. First record from Réunion and the Mascarenes by Fricke (1999: 71), based on SMNS material.
Distribution. Réunion. Marine species. Bathypelagic with diurnal vertical migrations, at depths of 0–2000 m. Outside the area, worldwide in tropical and temperate seas.
Conservation. Data deficient in Réunion (DD). Threats: FIB. Sensitivity to human activities unknown. Decline unknown. Low priority for conservation action.

### Serrivomeridae – Sawtooth eels

*Serrivomer beanii* Gill & Ryder, 1883 – Sawtooth eel
Taxonomy. First record from Réunion by Quéro & Saldanha (1995: 84); record confirmed by Fricke (1999: 72), based on MNHN material.
Distribution. Réunion. Marine species. Epibenthic-pelagic with diurnal vertical migrations, at depths of 10–5998 m. Outside the area, midwater depths in Indian Ocean and North Atlantic, south to Cape of Good Hope/South Africa.
Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitivity to human activities unknown. Decline unknown. Low priority for conservation action.

### Nettastomatidae – Duckbill eels

*Venefica proboscidea* (Vaillant, 1888) – Witch eel, whipsnout sorcerer
Taxonomy. First record from Réunion by Quéro & Saldanha (1995: 84); record confirmed by Fricke (1999: 72), based on MNHN material.
Distribution. Réunion. Marine species. Bathydemersal on the slope, at depths of 1500–2200 m. Outside the area, worldwide in tropical, subtropical and temperate seas.
Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitivity to human activities unknown. Decline unknown. Low priority for conservation action.

### Engraulidae – Anchovies

*Stolephorus commersonii* Lacepède [ex Commerson], 1803 – Commerson's anchovy
Taxonomy. Originally described from Réunion by Lacepède (1803: 381–383, pl. 12, fig. 1).
Distribution. Réunion, Mauritius, Madagascar. Transitional water and marine. Pelagic in coastal waters, at depths of 0–50 m. Outside the area, East Africa and Gulf of Aden east to New Guinea, north to South China Sea, south to Western Australia at 21°51'S and Queensland/Australia at 23°51'S.
Conservation. Extinct in Réunion (RE); species not observed since the 18th century. Threats: FIT, FIB. Sensitive to human activities. Keystone species. High priority for conservation action. Restoration of the habitat and reintroduction should be considered.

*Thryssa baelama* (Forsskål in Niebuhr, 1775) – Baelama anchovy, little priest; Anchois-moustache sardine
Taxonomy. Originally described from Réunion by Guichenot (1863: C29) as *Engraulis boelama*, and later by Bleeker (1874: 102) as *E. polynemoides*; record confirmed by Fricke (1999: 79), based on MNHN material.
Distribution. Réunion, Mauritius, Madagascar, Seychelles. Transitional water and marine. Pelagic in coastal waters near reefs, and in estuaries, at depths of 0–50 m. Outside the area, Red Sea and East Africa east to Caroline and Mariana islands, Samoa and Tonga, north to Ogasawara Islands, south to Western Australia, Queensland/Australia at 16°30'S, and New Caledonia.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, FIB. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

### Clupeidae – Herrings, shads, sardines and menhadens

*Amblygaster sirm* (Walbaum, 1792) – Spotted sardinella, spotted pilchard; Sardinelle tachetée
Taxonomy. First record from Réunion by Whitehead & Wongratana (1984: 2 unnumbered pp.).
Distribution. Réunion, Mauritius, Madagascar, Seychelles. Transitional water and marine. Pelagic in coastal waters and lagoons, at depths of 1–75 m. Outside the area, Red Sea and East Africa east to northern Gilbert Islands/Kiribati, Samoa and Tonga, north to southern Japan, south to Dampier Archipelago/Western Australia, Queensland/Australia south to 23°03'S and New Caledonia.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, FIB, CON. Rare. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Herklotsichthys quadrimaculatus* (Rüppell, 1837) – Bluestripe herring, blueline herring; Sardine (Réunion)

Taxonomy. First record from Réunion by WHITEHEAD (1985: 81–82); previously described by VALENCIENNES in CUVIER & VALENCIENNES (1847b: 349–350) as *Clupeonia fasciata*; record confirmed by FRICKE (1999: 73), based on MHNRUN and MNHN material. Species probably preoccupied by the unused name *Clupea mauritiana* Bennett, 1833 according to FRICKE (1999: 73); this case needs to be solved by petitioning ICZN.

Distribution. Réunion, Mauritius, Madagascar, Seychelles. Transitional water and marine. Pelagic in shallow water near coral reefs, at depths of 0–13 m. Outside the area, Red Sea, East Africa and Algoa Bay/South Africa east to Philippines, Samoa and Tonga, north to southern Japan and Ogasawara Islands, south to Western Australia at 21°38'S, Queensland/Australia south to 16°35'S, and New Caledonia, introduced into Hawaiian Islands.

Conservation. Near threatened in Réunion (NT). Threats: FIT, FIB, HAB. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Herklotsichthys spilurus* (Guichenot, 1863) – Réunion herring

Taxonomy. Originally described from Réunion by GUICHENOT (1863: C16–C17, C29); record confirmed by WHITEHEAD (1985: 82–83) and FRICKE (1999: 74), based on the MNHN syntypes.

Distribution. Réunion, Madagascar. Transitional water and marine. Pelagic in coastal waters, at depths of 0–50 m. Outside the area, East Africa, possibly formerly also in Mauritius.

Conservation. Extinct in Réunion (RE). Threats: FIT, FIB. Sensitive to human activities. Keystone species. High priority for conservation action. Reintroduction should be considered.

*Sardinella jussieu* (Lacepède [ex Commerson], 1803) – Mauritian sardinella; Sardine (Réunion)

Taxonomy. Originally described from Réunion by LACEPÈDE (1803: 469, 471–475) as *Clupanodon Jussieu*; probably the same species subsequently described by VALENCIENNES in CUVIER & VALENCIENNES (1847b: 346–349) as *Clupeonia Jussieui*; neotype designation of the holotype of *Clupanodon jussieui* Valenciennes (MNHN A.2208) as the neotype of *Clupanodon jussieu* Lacepède [ex Commerson] or a similar action would be necessary to stabilise current usage.

Distribution. Réunion, Mauritius, Madagascar. Transitional water and marine. Pelagic in coastal waters, at depths of 0–50 m. Outside the area, India and Sri Lanka, possibly also Vietnam, China and Taiwan.

Conservation. Endangered in Réunion (EN). Threats: FIT, FIB. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action. Proposed for Annexes II and V of the EU Habitats Directive.

*Sardinella melanura* (Cuvier, 1829) – Blacktip sardinella; Sardine à queue noire (Réunion)

Taxonomy. Based on an illustration from Réunion by LACEPÈDE (1803: pl. 11, fig. 3) as 'Variété de *Clupanodon Jussieu*', which was later named as *Clupea melanura* by CUVIER (1829: 318, footnote); taxonomic usage stabilised by a neotype (MNHN 3233) designated by WHITEHEAD (1967: 62); listed by GUICHENOT (1863: C29) as *Clupeonia Commersonii*, by BLEEKER (1874: 102) as *Clupea (Harengula) atricauda* (non Günther, 1868), and by BLANC & POSTEL (1958: 368, 170) as *Harengula vittata*; record confirmed by FRICKE (1999: 75–76), based on MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, northern Madagascar, Seychelles. Transitional water and marine. Pelagic in coastal waters, at depths of 0–50 m. Outside the area, Red Sea and East Africa east to eastern Indonesia and South Pacific east to Society and Marquesas islands, north to southern Japan and Ogasawara Islands, south to Queensland/Australia and New Caledonia.

Conservation. Endangered in Réunion (EN). Threats: FIT, FIB. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Spratelloides delicatulus* (Bennett, 1832) – Blue sprat, delicate round herring; Hareng rond (France)

Taxonomy. First record from Réunion by WHITEHEAD & WONGRATANA (1984: 2 unnumbered pp.).

Distribution. Réunion, Mauritius, Madagascar, Seychelles. Transitional water and marine. Pelagic in coastal waters near coral reefs, at depths of 0–50 m. Outside the area, Red Sea, East Africa and Natal/South Africa east to Marshall and Tuamotu islands, north to southern Japan, south to Western Australia at 33°37'S, Tasmania/Australia, and New Caledonia, recently immigrated into eastern Mediterranean Sea through Suez Canal.

Conservation. Least concern in Réunion (LC). Threats: FIT, FIB, HAB. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

## Chanidae – Milkfish

*Chanos chanos* (Forsskål in Niebuhr, 1775) – Milkfish; Chano

Taxonomy. First record from Réunion by FOURMANOIR & GUÉZÉ (1963: 24); previously listed by BLEEKER (1874: 102) as *C. lubina*.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Freshwater, transitional water and marine. Benthopelagic in offshore marine waters and shallow coastal embayments, but also frequently enter estuaries and occasionally penetrate freshwater streams, at depths of 0–30 m. Outside the area, Red Sea, East and South Africa east to Panama, north to southern Japan, south to Western Australia at 32°05'S, New South Wales/Australia and Norfolk Island.

Conservation. Extinct in Réunion (RE), last encountered in the 1960s. Threats: FIT, FIB, HAB, CON. Sensitive to human activities. Keystone species. High priority for conservation action.

## Gonorynchidae – Beaked sandfish

*Gonorynchus gonorynchus* (Linné, 1766) – Beaked sandfish; Caduchon

Taxonomy. First record from Réunion by FOURMANOIR & GUÉZÉ (1963: 58, fig. IIIC); previously described by VALENCIENNES in CUVIER & VALENCIENNES (1847a: 207–212, pl. 568) as *Gonorhynchus Gronovii*; record of *Gonorynchus gonorynchus* confirmed by FRICKE (1999: 82), based on MNHN and SAIAB material.

Distribution. Réunion. Freshwater, transitional water and marine. Demersal on sand bottoms, at depths of 0–200 m. Outside the area, Namibia southward around the Cape of Good Hope to Mozambique, Saint Helena.

Conservation. Extinct in Réunion (RE), last encountered in the 1960s. Threats: FIT, FIB, HAB, CON. Sensitive to human activities. Keystone species. High priority for conservation action.

### Cyprinidae – Carps and minnows

*Carassius auratus* (Linnaeus, 1758), golden form – Gold fish; Carassin doré
Taxonomy. First record from Réunion by Bleeker (1874: 102); previously described by Guichenot (1863: C14–C16, C29) as *Cyprinus Maillardi*.
Distribution. Introduced in Réunion (before 1863). Freshwater and transitional water. Outside the area, originally central Asia, China and Japan. Introduced throughout the world.
Conservation. Not evaluated in Réunion (NE). Not native of Réunion. No conservation action in favour of this species advisable.

*Cyprinus carpio* Linnaeus, 1758 – Common carp; Carpe commune
Distribution. Introduced in Réunion. Freshwater and transitional water. Outside the area, originally restricted to European Black Sea watersheds, widely introduced elsewhere.
Conservation. Not evaluated in Réunion (NE). Not native of Réunion. No conservation action in favour of this species advisable.

*Tanichthys albonubes* Lin, 1932 – Whitecloud mountain minnow
Distribution. Introduced in Réunion. Freshwater. Outside the area, originally restricted to southern China and northern Vietnam, introduced elsewhere.
Conservation. Not evaluated in Réunion (NE). Not native of Réunion. No conservation action in favour of this species advisable.

### Plotosidae – Eel catfishes

*Plotosus lineatus* (Thunberg, 1787) – Striped catfish, striped eel catfish; Machouaran (Réunion), balibot rayé (France)
Taxonomy. First record from Réunion by Guichenot (1863: C28); listed by Bleeker (1874: 75) as *P. arab*, and Fourmanoir & Guézé (1963: 12, fig. 1) as *P. anguillaris*; record of *P. lineatus* confirmed by Fricke (1999: 85), based on BPBM, MNHN and SMNS material. Forsskål in Niebuhr, 1775 described this species as [*Silurus*] "Arab. Boa vel Buja"; later authors inferred the name '*Plotosus arab*' as a senior synonym, but 'arab.' was not a species name, but an abbreviation for 'Arabicus', meaning 'Arabian language: *Boa* or *Bua*'. Forsskål only gave the genus plus two local Arabian names, and this therefore does not qualify as a binominal species description (discussion see Fricke 2008: 18).
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Transitional water and marine. Found in coral reefs. Also found in estuaries, tide pools and open coasts, at depths of 1–60 m. Outside the area, Red Sea, East Africa and Algoa Bay/South Africa east to Samoa and Tonga, north to southern Korea, southern Japan and Ogasawara Islands, south to Western Australia at 32°S and Lord Howe Island.
Conservation. Data deficient in Réunion (DD). Threats: FIB, HAB. Sensitive to human activities. Probable decline. Medium priority for conservation action.

### Salmonidae – Salmons and trouts

*Oncorhynchus mykiss* (Walbaum, 1792) – Rainbow trout; Truite arc-en-ciel
Taxonomy. Recorded from Réunion by Fricke (1999: 87).
Distribution. Introduced in Réunion since 1940, acclimatised since 1948 (Keith et al. 1999: 80). Freshwater, transitional water and marine. Outside the area, originally in temperate freshwater streams and coastal seas of the North Pacific, introduced worldwide.
Conservation. Not evaluated in Réunion (NE). Not native of Réunion. No conservation action in favour of this species advisable.

### Gonostomatidae – Bristlemouths

*Cyclothone alba* Brauer, 1906 – Bristlemouth
Taxonomy. First record from Réunion by Mukhacheva (1974: 192–195).
Distribution. Réunion, Mauritius, Rodrigues. Marine species. Mesopelagic, at depths of 300–600 m. Outside the area, in tropical and subtropical waters of all oceans.
Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitivity to human activities unknown. Keystone species. Decline unknown. Low priority for conservation action.

*Cyclothone braueri* Jespersen & Tåning, 1926 – Garrick; Palomine
Taxonomy. First record from Réunion by Mukhacheva (1974: 196–203).
Distribution. Réunion, Mauritius, Rodrigues. Marine species. Mesopelagic, adults mainly at depths of 200–900 m. Outside the area, worldwide in tropical and subtropical oceans, in the North Atlantic also in temperate waters north to 66°N.
Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitivity to human activities unknown. Keystone species. Decline unknown. Low priority for conservation action.

*Cyclothone microdon* (Günther, 1878) – Veiled anglemouth; Cyclothone jaune
Taxonomy. First record from Réunion by Mukhacheva (1974: 214–217).
Distribution. Réunion, Mauritius. Marine species. Mesopelagic, adults mainly at depths of 200–2700 m. Outside the area, in tropical, subtropical and temperate waters of all oceans, south to 45°S.
Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitivity to human activities unknown. Keystone species. Decline unknown. Low priority for conservation action.

*Cyclothone pallida* Brauer, 1902 – Tan bristlemouth, bicoloured bristlemouth
Taxonomy. First record from Réunion by Mukhacheva (1974: 206–210).
Distribution. Réunion, Mauritius, Rodrigues. Marine species. Mesopelagic, adults mainly at depths of 400–1000 m. Outside the area, in tropical and subtropical waters of all oceans, south to 40°S.
Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitivity to human activities unknown. Keystone species. Decline unknown. Low priority for conservation action.

### Sternoptychidae – Hatchetfishes

Remarks. An *Argyripnus* sp. is recorded by Durville et al. (submitted), based on MHNRUN material.

*Argyropelecus aculeatus* Valenciennes in Cuvier & Valenciennes, 1850 – Lovely hatchetfish; Hache d'argent à épines (France)
Taxonomy. First record from Réunion by Sauvage (1891: 483).

Record verified by DURVILLE et al. (submitted), based on MHNRUN material.
Distribution. Réunion. Marine species. Mesopelagic, at depths of 200–500 m during the day, diurnal vertical migration to about 150 m depth during the night. Outside the area, in tropical, subtropical and temperate waters of all oceans.
Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitivity to human activities unknown. Keystone species. Decline unknown. Low priority for conservation action.

*Argyropelecus hemigymnus* Cocco, 1829 – Half-naked hatchetfish
Taxonomy. First record from Réunion by DURVILLE et al. (submitted), based on MHNRUN material.
Distribution. Réunion. Marine species. Mesopelagic, at depths of 250–650 m during the day, diurnal vertical migration to about 100 m depth during the night. Outside the area, in tropical, subtropical and temperate waters of all oceans.
Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitivity to human activities unknown. Keystone species. Decline unknown. Low priority for conservation action.

*Polyipnus indicus* Schultz, 1961 – Indian hatchetfish
Taxonomy. First record from Réunion by DURVILLE et al. (submitted).
Distribution. Réunion. Marine species. Benthopelagic, at depths of 50–500 m. Outside the area, western Indian Ocean.
Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitivity to human activities unknown. Keystone species. Decline unknown. Low priority for conservation action.

*Valenciennellus tripunctulatus* (Esmark, 1871) – Constellation fish
Taxonomy. First record from Réunion by DURVILLE et al. (submitted), based on MHNRUN material.
Distribution. Réunion. Marine species. Bathypelagic, at depths of 100–1000 m. Outside the area, in tropical, subtropical and temperate waters of all oceans.
Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitivity to human activities unknown. Keystone species. Decline unknown. Low priority for conservation action.

## Phosichthyidae – Lightfishes

*Phosichthys argenteus* (Hutton, 1872) – Silver lightfish
Taxonomy. First record from Réunion by DURVILLE et al. (submitted), based on MHNRUN material.
Distribution. Réunion. Marine species. Bathypelagic, at depths of 300–1050 m. Outside the area, Indo-West Pacific and southeastern Atlantic.
Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitivity to human activities unknown. Keystone species. Decline unknown. Low priority for conservation action.

*Pollichthys mauli* (Poll, 1953) – Stareye lightfish
Taxonomy. First record from Réunion by DURVILLE et al. (submitted), based on MHNRUN material.
Distribution. Réunion. Marine species. Bathypelagic, at depths of 100–600 m. Outside the area, tropical and temperate Atlantic Ocean, and western Pacific.
Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitivity to human activities unknown. Keystone species. Decline unknown. Low priority for conservation action.

## Chorophthalmidae – Greeneyes

Remarks. *Chlorophthalmus* sp. is a **new record** for the family from Réunion, based on a photographed specimen collected by local fishermen, off Saint-Paul, at 550 m depth, in 2008 (P. DURVILLE, T. MULOCHAU).

## Synodontidae – Lizardfishes

*Saurida gracilis* (Quoy & Gaimard, 1824) – Graceful lizardfish, gracile lizardfish; Anoli grêle
Taxonomy. First record from Réunion by HARMELIN-VIVIEN (1976: 89); previously listed by GUICHENOT (1863: C29) as *S. nebulosa* (in part: non Valenciennes in Cuvier & Valenciennes, 1850); record confirmed by FRICKE (1999: 91–92), based on LEMUR, MNHN and SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Transitional water and marine. Found in sand and silty coral and rocky reefs; in shallow lagoons, reef flats, and sheltered seaward reefs, at depths of 0–135 m. Outside the area, Red Sea, East and South Africa east to Hawaiian Islands and Pitcairn Group, north to Ryukyu and Ogasawara islands, south to Western Australia and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: FIT, FIB, HAB. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Saurida nebulosa* Valenciennes in Cuvier & Valenciennes, 1850 – Clouded lizardfish, nebulous lizardfish; Anoli nuageux
Taxonomy. First record from Réunion by GUICHENOT (1863: C29, in part). Often confused with *S. gracilis*.
Distribution. Réunion, Mauritius, Aldabra. Transitional water and marine. Benthic on sand, mud, rock and in eel-grass habitats, primarily inshore, also near streams and river mouths; at depths of 0–6 m. Outside the area, Maldives east to Hawaiian and Society islands, north to Ogasawara Islands, south to New Caledonia and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: FIT, FIB. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Synodus binotatus* Schultz in Schultz, Herald, Lachner, Welander & Woods, 1953 – Twospot lizardfish; Anoli à deux taches
Taxonomy. First record from Réunion and the Mascarenes by FRICKE (1999: 92), based on SMNS material.
Distribution. Réunion, Madagascar, Seychelles. Marine species. Found in coral reefs and adjacent lagoons, at depths of 1–88 m. Outside the area, East Africa east to Hawaiian and Line islands, north to Ogasawara Islands, south to Western Australia and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Synodus dermatogenys* Fowler, 1912 – Banded lizardfish, sand lizardfish; Anoli bigarré
Taxonomy. First record from Réunion by DEBELIUS (1999: 53). Often confused with *S. variegatus*.
Distribution. Réunion, Rodrigues, Comores. Transitional water and marine. Found on sand or sand-rubble areas of lagoon and seaward coral reefs, at depths of 1–97 m. Outside the area, Red Sea and East Africa east to Hawaiian Islands and Pitcairn Group, south to Western Australia and New Caledonia.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Synodus variegatus* (Lacepède [ex Commerson], 1803) – Variegated lizardfish; Anoli bigarré
Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 89). Previously listed by Guichenot (1863: C29) as *Saurus cynodus* (non Linnaeus, 1758), and Bleeker (1874: 102) as *Synodus varius*. In original description by Lacepède (1803: 157) as *Salmo variegatus* and on pp. 224–228, pl. 3, fig. 3 as *Salmo varius*; first reviser Quoy & Gaimard (1824: 223–224) who chose the name *Saurus variegatus*. Record of *Synodus variegatus* confirmed by Fricke (1999: 94–95) based on LEMUR, MHNRUN and SMNS material. Often confused with *S. dermatogenys*.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles, Cargados Carajos. Marine species. Found in deep lagoon and seaward coral reefs, sometimes on sandy bottoms concealing itself in the sand, at depths of 2–121 m. Outside the area, Red Sea and East Africa east to Hawaiian Islands and Pitcairn Group, north to Ryukyu Islands, south to Lord Howe, Kermadec and Rapa islands, straying to New Zealand.
Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Trachinocephalus myops* (Schneider [ex Forster] in Bloch & Schneider, 1801) – Painted lizardfish; Anoli serpent
Taxonomy. First record from Réunion by Guichenot (1863: C29) as *Saurus myops*.
Distribution. Réunion, Mauritius, Madagascar. Transitional water and marine. Found on sand bottoms including estuaries, at depths of 1–388 m. Outside the area, circumtropical, north to Red Sea, southern Japan and Ogasawara Islands, south to Knysna/South Africa, Western Australia at 20°18'S, New South Wales/Australia and Lord Howe Island.
Conservation. Data deficient in Réunion (DD). Threats: FIT, FIB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

## Neoscopelidae – Blackchins

*Neoscopelus macrolepidotus* Johnson, 1863 – Large-scaled lanternfish
Taxonomy. First record from Réunion by Durville et al. (submitted), based on MHNRUN material.
Distribution. Réunion. Marine species. Benthopelagic, at depths of 300–1180 m. Outside the area, worldwide in tropical and temperate oceans, except most parts of the Indian Ocean.
Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitivity to human activities unknown. Keystone species (as this common species is a major food item for deep demersal predators, controlling their populations). Decline unknown. Low priority for conservation action.

## Myctophidae – Lanternfishes

*Benthosema fibulatum* (Gilbert & Cramer, 1897) – Spinycheek lanternfish
Taxonomy. First record from Réunion by Durville et al. (submitted), based on MHNRUN material.
Distribution. Réunion. Marine species. Benthopelagic and mesopelagic, in the upper 200 m at night, during the day down to 2000 m. Outside the area, in the Indian and Pacific oceans.
Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitivity to human activities unknown. Keystone species. Decline unknown. Low priority for conservation action.

*Bolinichthys supralateralis* (Parr, 1928)
Taxonomy. First record from Réunion by Durville et al. (submitted), based on MHNRUN material.
Distribution. Réunion. Marine species. Bathypelagic, at depths of 40–850 m. Outside the area, worldwide in tropical waters except eastern Pacific.
Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitivity to human activities unknown. Keystone species. Decline unknown. Low priority for conservation action.

*Ceratoscopelus warmingii* (Lütken, 1892) – Warming's lanternfish
Taxonomy. First record from Réunion by Durville et al. (submitted), based on MHNRUN material.
Distribution. Réunion. Marine species. Bathypelagic, at depths of 0–2014 m. Outside the area, worldwide in tropical and warm temperate waters except eastern Pacific.
Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitivity to human activities unknown. Keystone species. Decline unknown. Low priority for conservation action.

*Diaphus knappi* Nafpaktitis, 1978 – Knapp's lanternfish
Taxonomy. First record from Réunion by Durville et al. (submitted), based on MHNRUN material.
Distribution. Réunion, Madagascar, Saya de Malha Bank. Marine species. Bathypelagic, at depths of 122–664 m. Outside the area, tropical Indo-West Pacific.
Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitivity to human activities unknown. Keystone species. Decline unknown. Low priority for conservation action.

*Idiolychnus urolampus* (Gilbert & Cramer, 1897) – Tail-light lanternfish
Taxonomy. First record from Réunion by Durville et al. (submitted), based on MHNRUN material.
Distribution. Réunion, Madagascar. Marine species. Pelagic, at depths of 154–582 m. Outside the area, Kyushu-Palau Ridge, Hawaiian Islands, Nazca and Sala-y-Gomez ridges.
Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitivity to human activities unknown. Keystone species. Decline unknown. Low priority for conservation action.

*Lampanyctus nobilis* Tåning, 1928 – Noble lanternfish
Taxonomy. First record from Réunion by Durville et al. (submitted), based on MHNRUN material.
Distribution. Réunion. Marine species. Bathypelagic, found between 475–900 m during the day and between 100–500 m at night. Outside the area, tropical and warm temperate Indian and Pacific oceans.
Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitivity to human activities unknown. Keystone species. Decline unknown. Low priority for conservation action.

*Lampanyctus pusillus* (Johnson, 1890) – Pygmy lanternfish
Taxonomy. First record from Réunion by Durville et al. (submitted), based on MHNRUN material.
Distribution. Réunion. Marine species. Bathypelagic, found between 425–850 m during the day and between 40–125 m at night. Outside the area, tropical and temperate Atlantic, southern Indian and South Pacific oceans.
Conservation. Data deficient in Réunion (DD). Threats: EUT.

Sensitivity to human activities unknown. Keystone species. Decline unknown. Low priority for conservation action.

*Symbolophorus rufinus* (Tåning, 1928) – Red symbol lanternfish
Taxonomy. First record from Réunion and the Mascarenes by Fricke (1999: 98), based on SMNS material.
Distribution. Réunion. Marine species. Pelagic, at depths of 425–850 m during the day, and 0–125 m at night. Outside the area, eastern Atlantic from 28°N to 16°S, tropical Indian Ocean, Papua New Guinea.
Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitivity to human activities unknown. Keystone species. Decline unknown. Low priority for conservation action.

## Lampridae – Opahs

*Lampris guttatus* (Brünnich, 1788) – Spotted opah, kingfish; Lampris
Taxonomy. First record from Réunion by Fricke (1999: 98), based on MHNRUN material.
Distribution. Réunion. Marine species. Bathypelagic. Oceanic, mainly pelagic, at depths of 10–400 m. Outside the area, worldwide in subtropical and temperate oceans.
Conservation. Threatened migrant in Réunion (TM). Threats: FIB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

## Lophotidae – Crestfishes

*Lophotus lacepede* Giorna, 1809 – Crested oarfish; Lophotes
Taxonomy. First record from Réunion by Ribes-Beaudemoulin et al. (2002) and Letourneur et al. (2004: 204).
Distribution. Réunion. Marine species. Mesopelagic, at depths of 0–92 m. Outside the area, worldwide in tropical and warm temperate oceans.
Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitivity to human activities unknown. Decline unknown. Low priority for conservation action.

## Trachipteridae – Ribbonfishes

*Trachipterus jacksonensis* (Ramsay, 1881) – Blackflash ribbon fish, dealfish
Taxonomy. First record from Réunion by Fricke (1999: 98), based on MHNRUN material.
Distribution. Réunion. Marine species. Pelagic, at depths of 0–1000 m. Outside the area, South Africa, southern Australia.
Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitive to human activities. Decline unknown. Low priority for conservation action.

## Polymixiidae – Beardfishes

*Polymixia busakhini* Kotlyar, 1992 – Pacific beardfish
Taxonomy. **New record** from Réunion, based on reexamination of MNHN material listed by Fricke (1999: 99) under the name *P. berndti* (non Gilbert, 1905); previously listed by Guichenot (1863: C26) as *Neobrama Webbi* (non Valenciennes, 1837), and by Bleeker (1874: 86) as *Polymixia nobilis* (non Lowe, 1838). Also MHNRUN material (Durville et al. submitted).
Distribution. Réunion, Mauritius, Madagascar Ridge. Marine species. Bathydemersal, at depths of 410–600 m. Outside the area, Mozambique, eastern Australia, New Zealand. Probably more widespread.
Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitive to human activities. Decline unknown. Low priority for conservation action.

## Macrouridae – Grenadiers

*Caelorinchus acanthiger* Barnard, 1925 – Surgeon grenadier
Taxonomy. First record from Réunion and the Mascarenes by Fricke (1999: 99); previously recorded by Fourmanoir & Guézé (1963: 20, pl. 5) as *Coelorhynchus flabellispinus* (non Alcock, 1894).
Distribution. Réunion. Marine species. Bathydemersal, at depths of 800–1500 m. Outside the area, continental slopes of southeastern Atlantic, southern Indian Ocean, southern Australia and New Zealand.
Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitive to human activities. Keystone species. Decline unknown. Low priority for conservation action.

## Moridae – Morid cods

*Gadella* sp.
Taxonomy. First record from Réunion as *Gadella jordani* (non Böhlke & Mead, 1951) by Durville et al. (submitted), based on MHNRUN material.
Distribution. Réunion. Marine species. Benthopelagic. Known only from the area.
Conservation. Data deficient in Réunion (DD). Threats: FIB. Sensitivity to human activities unknown. Decline unknown. Low priority for conservation action.

*Laemonema macronema* Meléndez & Markle, 1997
Taxonomy. Original description from Réunion by Meléndez & Markle (1997: 638), based on SAIAB and MNHN material.
Distribution. Réunion, Mauritius. Marine species. Bathydemersal, at depths of 300–400 m. Endemic to western Mascarenes.
Conservation. Data deficient in Réunion (DD). Threats: FIB. Sensitivity to human activities unknown. Decline unknown. Low priority for conservation action.

*Physiculus argyropastus* Alcock, 1894
Taxonomy. First record from Réunion by Durville et al. (submitted), based on MHNRUN material.
Distribution. Réunion, Mauritius. Marine species. Benthopelagic, at depths of 200–300 m. Outside the area, India.
Conservation. Data deficient in Réunion (DD). Threats: FIB. Sensitivity to human activities unknown. Decline unknown. Low priority for conservation action.

## Carapidae – Pearl fishes

*Encheliophis gracilis* (Bleeker, 1856) – Graceful pearlfish, slender pearlfish
Taxonomy. First record from Réunion by Fricke (1999: 102), based on SMNS material.
Distribution. Réunion, Mauritius, Madagascar, Aldabra. Marine

species. Benthic, living in starfish and holothurians, at depths of 5–62 m. Outside the area, Red Sea, East Africa and Natal/South Africa east to Palau/Belau, Mariana and Society islands, south to New Caledonia.
Conservation. Near threatened in Réunion (NT). Threats: FIB, EUT, HOS. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Encheliophis homei* (Richardson, 1846) – Silver pearlfish
Taxonomy. First record from Réunion by Guichenot (1863: C30) as *Fierasfer homei*; record confirmed by Fricke (1999: 101–102) as *Carapus homei*, based on LEMUR and MNHN material.
Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Benthic, reef-associated, living in holothurians, at depths of 0–30 m. Outside the area, Red Sea and East Africa east to Hawaiian, Society and Gambier islands, north to Ryukyu Islands, south to Western Australia, Queensland/Australia and New Caledonia.
Conservation. Near threatened in Réunion (NT). Threats: FIB, EUT, HAB, HOS. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Pyramodon ventralis* Smith & Radcliffe in Radcliffe, 1913
Taxonomy. First record from Réunion by Durville et al. (submitted), based on MHNRUN material.
Distribution. Réunion. Marine species. Benthopelagic, at depths of 184–470 m. Outside the area, East and South Africa east to Indonesia, north to southern Japan, south to Queensland/Australia and New Caledonia.
Conservation. Near threatened in Réunion (NT). Threats: FIB, EUT, HOS. Sensitive to human activities. Probable decline. Medium priority for conservation action.

### Ophidiidae – Cuskeels, snake blennies

*Acanthonus armatus* Günther, 1878 – Bony-eared assfish
Taxonomy. First record from Réunion and the Mascarenes by Fricke (1999: 100), based on MNHN material.
Distribution. Réunion. Marine species. Bathypelagic, at depths of 1500–4415 m. Outside the area, worldwide in tropical and subtropical seas.
Conservation. Data deficient in Réunion (DD). Threats: FIB. Sensitivity to human activities unknown. Decline unknown. Low priority for conservation action.
Remarks. Common name based on Froese & Pauly (2008).

*Bassozetus galatheae* Nielsen & Merrett, 2000
Taxonomy. First record from Réunion and the Mascarenes by Nielsen & Merrett (2000: 26–30); previously listed as *B. glutinosus* (non Alcock, 1890) by Fricke (1999: 100), based on MNHN material.
Distribution. Réunion. Marine species. Bathypelagic, at depths of 1530–2040 m. Outside the area, off East Africa to Hawaiian Islands, south to New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: FIB. Sensitivity to human activities unknown. Decline unknown. Low priority for conservation action.

*Brotula multibarbata* Temminck & Schlegel, 1846 – Reef cusk eel, bearded brotula, goatsbeard brotula; Brotule barbe-de-boue
Taxonomy. First record from Réunion by Hubbs (1944: 170–175); previously described by Kaup (1858: 92) as *B. burbonensis* (locality Réunion not stated, but implied from species name); record confirmed by Fricke (1999: 100–101), based on MHNRUN and MNHN material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Marine species. Found in shallow lagoon and seaward reefs and on the shelf and upper slope, at depths of 0–650 m. Outside the area, Red Sea, East and South Africa east to Hawaiian Islands and Pitcairn Group, north to southern Japan and Ogasawara Islands, south to Rowley Shoals/Western Australia at 17°56'S and Lord Howe Island.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Holcomycteronus aequatoris* (Smith & Radcliffe in Radcliffe, 1913)
Taxonomy. First record from Réunion and the Mascarenes by Fricke (1999: 101), based on MNHN material.
Distribution. Réunion. Marine species. Bathydemersal, at depths of 1510–4030 m. Outside the area, South and East Africa east to Philippines, north to Taiwan.
Conservation. Data deficient in Réunion (DD). Threats: FIB. Sensitivity to human activities unknown. Decline unknown. Low priority for conservation action.

*Neobythites multistriatus* Nielsen & Quéro, 1991
Taxonomy. Originally described from off Réunion by Nielsen & Quéro (1991: 194, figs. 1–4).
Distribution. Réunion, Rodrigues. Marine species. Bathydemersal, at depths of 300–490 m. Endemic to Mascarenes.
Conservation. Data deficient in Réunion (DD). Threats: FIB. Local importance. Sensitivity to human activities unknown. Decline unknown. Low priority for conservation action.

### Bythitidae – Viviparous brotulas

*Dinematichthys iluocoeteoides* Bleeker, 1855
Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 89, part) as *Dinematichthys iluocaetoides*.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Seychelles, Cargados Carajos. Marine species. Found in holes of coral reefs, at depths of 0–6 m. Outside the area, Red Sea and East Africa east to Samoa and Tonga, north to Ryukyu and Ogasawara islands, south to New Caledonia.
Conservation. Vulnerable in Réunion (VU). Threats: HAB, EUT. Rare. Sensitive to human activities. Significant decline (assumed according to habitat decline). Medium priority for conservation action.

*Mascarenichthys heemstrai* Schwarzhans & Møller, 2007
Taxonomy. First record from Réunion by Schwarzhans & Møller (2007: 78–81), based on SMNS material; previously listed from Réunion by Fricke (1999: 102–103, part) as *Brosmophyciops pautzkei* (non Schultz in Schultz, Chapman, Lachner & Woods, 1960).
Distribution. Réunion, Mauritius, Seychelles, Cargados Carajos. Marine species. Found in holes of volcanic rocks adjacent to coral reefs, including tidal pools, at depths of 0–10 m. Endemic to islands in the southwestern Indian Ocean.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

### Lophiidae – Anglerfishes

*Lophiodes mutilus* (Alcock, 1894) – Smooth angler; Bandroie marache
Taxonomy. First record from Réunion and the Mascarenes by Fricke (1999: 103), based on MNHN material.
Distribution. Réunion, Madagascar. Marine species. Bathydemersal on the upper slope, at depths of 300–760 m. Outside the area, South and East Africa east to Vanuatu and Wallis & Futuna, north to southern Japan, south to northern Australia.
Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitive to human activities. Decline unknown. Low priority for conservation action.

### Antennariidae – Anglers

*Antennarius coccineus* (Cuvier in Lesson, 1831) – Scarlet frogfish, freckled angler, freckled frogfish; Grenouille écarlate
Taxonomy. First record from Réunion by Guichenot (1863: C28) as *Chironectes coccineus*.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles, Cargados Carajos. Marine species. Demersal, secretive among rocks and sponges, from tidal pools to 75 m depth. Outside the area, Red Sea and East Africa east to Panama and Chile, north to Ryukyu Islands, south to Fremantle/Western Australia and Lord Howe Island.
Conservation. Endangered in Réunion (EN). Threats: HAB, EUT. Rare. Sensitive to human activities. Significant decline. High priority for conservation action.

*Antennarius commerson* (Lacepède [ex Commerson] in Anonymus, 1798) – Big angler, giant frogfish, Commerson's frogfish; Grenouille de Commerson
Taxonomy. First record from Réunion by Bleeker (1874: 71) as *A. Commersonii*; record confirmed by Fricke (1999: 104–105), based on MNHN material. Authorship often attributed to Latreille (1804: 73), but name is available from an earlier publication by Lacepède [ex Commerson] in Anonymus (1798: 681) (see Fricke 1999: 105).
Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Demersal, secretive in lagoon and seaward reefs, on coral, rock or sand, from tidal pools to 45 m depth. Outside the area, Red Sea, East Africa and Natal/South Africa east to Panama, north to southern Japan, Ogasawara, Hawaiian and Society islands, south to Houtman Abrolhos/Western Australia and Lord Howe Island.
Conservation. Endangered in Réunion (EN). Threats: HAB, EUT. Rare. Sensitive to human activities. Significant decline. High priority for conservation action.

*Antennarius hispidus* (Bloch & Schneider, 1801) – Hispid frogfish, shaggy angler
Taxonomy. First record from Réunion by Valenciennes in Cuvier & Valenciennes (1837: 407–412) as *Chironectes hispidus*; record confirmed by Fricke (1999: 105), based on SMNS material.
Distribution. Réunion, Mauritius. Marine species. Demersal, secretive in lagoon and seaward coral or rocky reefs, on coral, rock, sand or mud, from shallow water to 90 m depth. Outside the area, South and East Africa to Indonesia, Samoa and Tonga, north to Taiwan, south to Broome/Western Australia and Loyalty Islands.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Antennarius nummifer* (Cuvier, 1817) – Coin-bearing frogfish, spotfin angler, spotfin frogfish
Taxonomy. First record from Réunion by Fricke (1999: 106), based on MNHN material.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar. Marine species. Demersal, secretive in lagoon and seaward coral or rocky reefs, on various substrates, from tidal pools to 293 m depth. Outside the area, Azores, Madeira, Canary Islands, St Helena, Red Sea, East and South Africa east to Hawaiian and Society islands, north to southern Japan, south to Rottnest Island/Western Australia and northern New Zealand.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Antennarius pictus* (Shaw in Shaw & Nodder, 1794) – Painted frogfish
Taxonomy. First record from Réunion by Pietsch & Grobecker (1987: 79–87); previously listed by Danois (1964: 118) as *Phrynelox polyophthalmus*; record of *Antennarius pictus* confirmed by Fricke (1999: 106–107), based on MNHN material.
Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Demersal, secretive in lagoon and seaward coral reefs, adults mimicking sponges, usually on sponges, open sand or rock, from shallow water to 75 m depth. Outside the area, Red Sea, East and South Africa east to Hawaiian and Society islands, north to Philippines and Midway Islands, south to Ningaloo Reef/Western Australia, Lord Howe and Norfolk islands.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Antennarius scriptissimus* Jordan, 1902 – Calico frogfish
Taxonomy. First record from Réunion by Pietsch & Grobecker (1987: 123–125) as *Antennarius sarasa*; record confirmed by Fricke (1999: 107), based on MNHN material.
Distribution. Réunion. Marine species. Demersal, secretive in rocky reefs, apparently preferring volcanic rock, from shallow water to 185 m depth. Outside the area, Oman east to Philippines, north to southern Japan, south to New Zealand.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Antennarius striatus* (Shaw in Shaw & Nodder, 1794) – Striated frogfish, striped angler
Taxonomy. First record from Réunion by Pietsch & Grobecker (1987: 54–71); previously listed by Guichenot (1863: C28) as *Chironectes scaber*; record confirmed by Fricke (1999: 107–108), based on MNHN and SMNS material.
Distribution. Réunion, Mauritius. Marine species. Demersal, secretive in rocky or coral reefs on rock, rubble, sand, or among seagrass, from shallow water to 219 m depth. Outside the area, tropical western and eastern Atlantic, Red Sea and East Africa east to Hawaiian and Society islands, north to southern Japan, south to Houtman Abrolhos Islands/Western Australia and northern New Zealand.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Histrio histrio* (Linnaeus, 1758) – Sargassum frogfish, sargassumfish; Sargasse
Taxonomy. First record from Réunion by Bleeker (1874: 71, 72)

as *Antennarius histrio* and *A. marmoratus*; previously listed by GUICHENOT (1863: C27) as *Chironectes Mesogallicus* [misspelling for *nesogallicus*]; record of *Histrio histrio* confirmed by FRICKE (1999: 108–109), based on MNHN material.

Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Pelagic, adults are associated with floating seaweed and are usually taken near the surface; frequently blown into inshore waters by storms; larvae and postlarvae occur at depths of 50–600 m, but no specimens larger than 4 mm SL were taken below 50 m. Outside the area, worldwide in tropical and temperate oceans.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

### Chaunacidae – Coffinfishes

*Chaunax umbrinus* Gilbert, 1905

Taxonomy. First record from Réunion and the Mascarenes by FRICKE (1999: 110), based on MNHN material.

Distribution. Réunion. Marine species. Demersal, at depths of 183–400 m. Outside the area, worldwide in tropical and subtropical oceans, mainly around volcanic islands.

Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitivity to human activities unknown. Decline unknown. Low priority for conservation action.

### Ogcocephalidae – Seabats

*Halieutaea coccinea* Alcock, 1889 – Spiny seabat

Taxonomy. First record from Réunion and the Mascarenes by FRICKE (1999: 110), based on MNHN material.

Distribution. Réunion. Marine species. Bathydemersal, at depths around 500 m. Outside the area, South Africa east to Indonesia, south to Western Australia.

Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitive to human activities. Decline unknown. Low priority for conservation action.

*Halieutopsis bathyoreos* Bradbury, 1988

Taxonomy. First record from Réunion and the Mascarenes by FRICKE (1999: 110), based on MNHN material.

Distribution. Réunion. Marine species. Bathydemersal, at depths around 1500 m. Outside the area, east to New Guinea, north to southern Japan.

Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitive to human activities. Decline unknown. Low priority for conservation action.

### Mugilidae – Mullets

*Agonostomus telfairii* Bennett, 1832 – Fairy mullet; Chitte (Réunion), mulet enchanteur (France)

Taxonomy. First record from Réunion by PLAYFAIR & GÜNTHER (1867: 79) as *Agonostoma telfairi*; previously described as *Nestis cyprinoides* by VALENCIENNES in CUVIER & VALENCIENNES (1836: 167–171); subsequently listed as *Agonostoma dobuloides* by BLEEKER (1874: 79); record confirmed by FRICKE (1999: 357–358), based on MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles. Freshwater, transitional and marine water. Mainly found in freshwater, but occasionally in estuaries, larvae in adjacent marine habitats. Endemic to islands in the southwestern Indian Ocean.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, CON. Local importance. Rare. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action. Proposed for Annexes II and V of the EU Habitats Directive.

*Chelon melinopterus* (Valenciennes in Cuvier & Valenciennes, 1836) – Giantscale mullet, otomebora mullet; Mulet otomebora

Taxonomy. First record from Réunion by FRICKE (1999: 359).

Distribution. Réunion, Mauritius. Transitional and marine water. Found in shallow coastal waters, entering lagoons, estuaries and rivers. Outside the area, South and East Africa east to Tuamotu and Marquesas islands, north to Philippines, south to New Caledonia and Austral Islands.

Conservation. Data deficient in Réunion (DD). Threats: FIT, CON. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Crenimugil crenilabis* (Forsskål in Niebuhr, 1775) – Fringelip mullet; Mulet boxeur

Taxonomy. First record from Réunion by FRICKE (1999: 358), based on SMNS material.

Distribution. Réunion, Mauritius, Madagascar, Comores. Transitional and marine water. Found in coastal waters, over sandy or muddy areas of lagoons, reef flats and tide pools; enters estuaries. Outside the area, Red Sea and East Africa east to Marshall, Marquesas and Gambier islands, possibly east to Hawaiian Islands, north to southern Japan, south to Lord Howe Island and Rapa.

Conservation. Least concern in Réunion (LC). Threats: FIT, CON. Not sensitive to human activities. Keystone species. Stable populations. Low priority for conservation action.

*Ellochelon vaigiensis* (Quoy & Gaimard, 1825) – Squaretail mullet, yellowtail mullet; Mulet mopiro

Taxonomy. First record from Réunion by FRICKE (1999: 359), based on SMNS material.

Distribution. Réunion, Madagascar. Freshwater, transitional and marine water. Found in lagoons, entering estuaries, rivers and streams. Outside the area, East Africa east to Marshall, Gambier and Marquesas islands, north to southern Japan, south to Shark Bay/Western Australia, New South Wales/Australia, New Caledonia and Rapa.

Conservation. Least concern in Réunion (LC). Threats: FIT, CON. Not sensitive to human activities. Keystone species. Stable populations. Low priority for conservation action.

*Moolgarda cunnesius* (Valenciennes in Cuvier & Valenciennes, 1836) – Longarm mullet; Mulet, muge (Réunion), mulet longue aile (France)

Taxonomy. First record from Réunion by MARQUET et al. (1997: 30); record confirmed by FRICKE (1999: 361–362), based on MHNRUN material.

Distribution. Réunion, Madagascar. Freshwater, transitional and marine water. Found in coastal waters including lagoons, entering estuaries, rivers and streams. Outside the area, Red Sea, East and South Africa east to New Guinea and Vanuatu, north to Taiwan, south to northern Australia.

Conservation. Data deficient in Réunion (DD). Threats: FIT, CON. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Moolgarda robusta* (Günther, 1861) – Robust mullet; Mulet robuste
Taxonomy. First record from Réunion as *Valamugil robustus* by Marquet et al. (1997: 30); record confirmed by Fricke (1999: 362), based on MHNRUN material.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar. Freshwater, transitional and marine water. Found in coastal waters including lagoons, entering estuaries, rivers and streams. Outside the area, southeastern Africa.
Conservation. Data deficient in Réunion (DD). Threats: FIT, CON. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Moolgarda seheli* (Forsskål in Niebuhr, 1775) – Bluespot mullet; Mulet à tache bleue
Taxonomy. First record from Réunion by Blanc & Postel (1958: 368); previously listed as *Mugil axillaris* by Guichenot (1863: C27), and as *Mugil coeruleomaculatus* by Bleeker (1874: 79); record confirmed by Fricke (1999: 360), based on MHNRUN and MNHN material.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Freshwater, transitional and marine water. Found in coastal waters including lagoons, entering estuaries, rivers and streams. Outside the area, Red Sea and East Africa east to Hawaiian and Marquesas islands, north to southern Japan, south to Derby/Western Australia and Norfolk Island.
Conservation. Data deficient in Réunion (DD). Threats: FIT, CON. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Mugil cephalus* Linnaeus, 1758 – Flathead mullet; Mulet, muge (Réunion), mulet cabot (France)
Taxonomy. First record from Réunion by Thomson & Luther (1984: 2 unnumbered pp.); previously described as *M. borbonicus* by Valenciennes in Cuvier & Valenciennes (1836: 113–114), and listed as *M. cephalotes* by Bleeker (1874: 79); record confirmed by Fricke (1999: 360–361), based on MNHN material.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Freshwater, transitional and marine water. Found in coastal waters including lagoons, entering estuaries, rivers and streams. Outside the area, worldwide in tropical and temperate seas, in the Indian Ocean north to Red Sea.
Conservation. Data deficient in Réunion (DD). Threats: FIT, CON. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

### Atherinidae – Silversides

*Atherinomorus lacunosus* (Bloch & Schneider [ex Forster], 1801) – Hardyhead silverside; Athérine têtue
Taxonomy. First record from Réunion by Ivantsoff (1984: 2 unnumbered pp.) previously listed by Guichenot (1863: C27) as *Atherina pectoralis* and Bleeker (1874: 79) as *Atherina pinguis*; record of *Atherinomorus lacunosus* confirmed by Fricke (1999: 111–113), based on MHNRUN, MNHN and SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Transitional water and marine. Pelagic, schooling along sandy shorelines and reef margins, at depths of 0–39 m. Outside the area, Indo-West Pacific from Red Sea and East Africa east to Hawaiian and Tuamotu islands, north to southern Japan and Ogasawara Islands, south to Western Australia, New South Wales/Australia and Rapa, recently immigrated into eastern Mediterranean through Suez Canal.
Conservation. Least concern in Réunion (LC). Threats: FIT, FIB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

### Exocoetidae – Flying fishes

*Cheilopogon cyanopterus* (Valenciennes in Cuvier & Valenciennes, 1847) – Blackwing flyingfish; Exocet cadène
Taxonomy. First record from Réunion area by Parin & Gibbs (1984: 7).
Distribution. Réunion. Marine species. Pelagic, oceanic, schooling in the upper 20 m of depth, often near the surface. Outside the area, worldwide in tropical and subtropical seas, in the Indian Ocean north to Red Sea, south to Natal/South Africa.
Conservation. Vulnerable in Réunion (VU). Threats: FIB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Cheilopogon furcatus* (Mitchill, 1815) – Spotfin flyingfish; Exocet tacheté
Taxonomy. First record from Réunion area by Parin & Gibbs (1984: 9).
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Marine species. Pelagic, oceanic, schooling near the surface. Outside the area, worldwide in tropical and subtropical ocean waters, in the Indian Ocean south to Cape of Good Hope/South Africa and Western Australia.
Conservation. Vulnerable in Réunion (VU). Threats: FIB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Cheilopogon nigricans* (Bennett, 1840) – African flyingfish; Exocet africain
Taxonomy. First record from Réunion area by Parin & Gibbs (1984: 11).
Distribution. Réunion, Mauritius, Rodrigues. Marine species. Pelagic, oceanic, schooling near the surface. Outside the area, worldwide in tropical and subtropical ocean waters, in the Indian Ocean south to Aldabra and Natal/South Africa.
Conservation. Vulnerable in Réunion (VU). Threats: FIB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Cypselurus naresii* (Günther, 1889) – Pharao flyingfish; Exocet pharaon
Taxonomy. First record from Réunion area by Parin & Gibbs (1984: 15).
Distribution. Réunion, Mauritius, Rodrigues, Madagascar. Marine species. Pelagic, oceanic, schooling near the surface. Outside the area, East Africa east to Marquesas Islands, north to southern Japan, south to northern Australia.
Conservation. Vulnerable in Réunion (VU). Threats: FIB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Cypselurus poecilopterus* (Valenciennes in Cuvier & Valenciennes, 1847) – Yellow-wing flyingfish; Exocet aile jaune
Taxonomy. First record from Réunion area by Parin & Gibbs (1984: 19).
Distribution. Réunion, Mauritius, Rodrigues. Marine species. Pelagic, oceanic, schooling near the surface. Outside the area, East Africa east to Wake Atoll, Samoa and Tonga, north to southern Japan, south to North-West Cape/Western Australia, Queensland/Australia and New Caledonia.
Conservation. Vulnerable in Réunion (VU). Threats: FIB, EUT.

Sensitive to human activities. Significant decline. Low priority for conservation action.

*Exocoetus monocirrhus* Richardson, 1846 – Two-wing flyingfish, barbel flyingfish
Taxonomy. First record from Réunion area by PARIN & GIBBS (1984: 2 unnumbered pp.).
Distribution. Réunion, Mauritius, Rodrigues, Madagascar. Marine species. Pelagic, oceanic, schooling near the surface. Outside the area, East Africa east to Panama, north to southern Japan, south to northern Australia.
Conservation. Vulnerable in Réunion (VU). Threats: FIB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Exocoetus volitans* Linnaeus, 1758 – Tropical two-wing flyingfish; Exocet volant
Taxonomy. First record from Réunion area by PARIN & GIBBS (1984: 2 unnumbered pp.); previously listed by GUICHENOT (1863: C29) as *E. Commersonii* and *E. evolans*, and by BLEEKER (1874: 101) as *E. brachysoma*; record confirmed by FRICKE (1999: 122–123), based on MNHN material.
Distribution. Réunion, Mauritius, Rodrigues, Aldabra, Seychelles. Marine species. Pelagic, oceanic, schooling near the surface. Outside the area, worldwide in tropical and subtropical waters, north to Red Sea, south to Western Australia at 22°S, Queensland/Australia at 17°S, New Caledonia, Tonga and Rapa.
Conservation. Vulnerable in Réunion (VU). Threats: FIB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Parexocoetus brachypterus* (Günther, 1866) – Sailfin flyingfish; Exocet voilier
Taxonomy. First record from Réunion area by PARIN & GIBBS (1984: 2 unnumbered pp.); confirmed by FRICKE (1999: 123), based on MHNRUN material.
Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Pelagic, oceanic, schooling near the surface. Outside the area, East Africa east to Hawaiian and Marquesas islands, south to Western Australia, Queensland/Australia, New Caledonia and Tonga, Panama (East Pacific).
Conservation. Vulnerable in Réunion (VU). Threats: FIB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Prognichthys sealei* Abe, 1955 – Sailor flyingfish; Exocet matelot
Taxonomy. First record from Réunion area by PARIN & GIBBS (1984: 33).
Distribution. Réunion, Mauritius, Rodrigues. Marine species. Pelagic, oceanic, schooling near the surface. Outside the area, East and South Africa east to Hawaiian Islands, possibly also eastern Pacific.
Conservation. Vulnerable in Réunion (VU). Threats: FIB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

### Hemiramphidae – Halfbeaks

*Hemiramphus far* (Forsskål in Niebuhr, 1775) – Black-barred halfbeak; Demi-bec bagnard
Taxonomy. First record from Réunion by BLEEKER (1874: 101) as *Hemirhamphus far*; previously listed by GUICHENOT (1863: C29) as *Hemirhamphus Commersonii*; record confirmed by FRICKE (1999: 118–119), based on MNHN material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Transitional water and marine. Found in areas rich in vegetation and sand flats, also entering estuaries, at depths of 0–6 m. Outside the area, Red Sea, East and South Africa, east to Philippines, Samoa and Tonga, north to Izu Peninsula/southern Japan, south to Broome/Western Australia, New South Wales/Australia and New Caledonia, recently immigrated through Suez Canal into Mediterranean Sea.
Conservation. Near threatened in Réunion (NT). Threats: FIT, FIB, HAB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Hyporhamphus erythrorinchus* (LeSueur, 1821) – Mauritius halfbeak; Balaou (Réunion)
Taxonomy. First record from Réunion by GUICHENOT (1863: C29) as *Hemirhamphus erythrorhynchus*.
Distribution. Réunion, Mauritius, Cargados Carajos. Transitional water and marine. Pelagic, at depths of 0–6 m. Endemic to islands in the southwestern Indian Ocean.
Conservation. Extinct in Réunion (RE). Threats: FIT, FIB, HAB, EUT. Local importance. Sensitive to human activities. High priority for conservation action.

### Belonidae – Garpikes, needlefishes

*Ablennes hians* (Valenciennes in Cuvier & Valenciennes, 1846) – Flat needlefish, barred needlefish; Orphie plate
Taxonomy. First record from Réunion by LETOURNEUR (1992: unpag. 1); previously listed by GUICHENOT (1863: C29) as *Belone melanostigma*; record of *Ablennes hians* confirmed by FRICKE (1999: 116), based on MHNRUN material.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles, Cargados Carajos. Freshwater, transitional water and marine. Found in coastal waters near the surface, including estuaries and lower reaches of rivers, at depths of 0–3 m. Outside the area, worldwide in tropical and warm temperate waters, in Indian Ocean north to Red Sea, south to Algoa Bay/South Africa.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Platybelone platyura* (Bennett, 1832) – Keeltail needlefish; Orphie carène
Taxonomy. First record from Réunion by BLEEKER (1874: 100) as *Mastaccembelus platurus*. Usually treated as a subspecies of *Platybelone argalus* (LeSueur, 1821).
Distribution. Réunion, Mauritius, Rodrigues, Comores, Aldabra, Seychelles. Freshwater, transitional water and marine. Found in inshore and offshore waters near the surface, including estuaries and lower reaches of rivers, at depths of 0–2 m. Outside the area, East Africa east to Hawaiian, Easter and Sala-y-Gomez islands, north to east of central Japan and Ogasawara Islands, south to Kimberleys/Western Australia, Lord Howe and Kermadec islands, and Rapa.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Strongylura leiura* (Bleeker, 1850) – Yellowfin needlefish; Orphie littorale
Taxonomy. First record from Réunion by LETOURNEUR (1991: 164).
Distribution. Réunion, Mauritius, Comores, Aldabra, Seychelles. Transitional water and marine. Found in coastal

waters near the surface, including estuaries and lower reaches of rivers, at depths of 0–3 m. Outside the area, East Africa east to Hawaiian, Easter and Sala-y-Gomez islands, north to central Japan and Ogasawara Islands, south to Kimberleys/ Western Australia, Lord Howe and Kermadec islands, and Rapa.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Tylosurus crocodilus* (Péron & LeSueur in LeSueur, 1821) – Hound needlefish, crocodile needlefish; Aiguille (Réunion), orphie crocodile (France)

Taxonomy. First record from Réunion by Guichenot (1863: C29) as *Belone crocodila*; subsequently listed by Bleeker (1874: 100) as *Mastaccembelus choram* (non Rüppell, 1837); record confirmed by Fricke (1999: 117), based on MNHN material. Usually treated as the nominal subspecies of *Tylosurus crocodilus*, with another subspecies, *T. c. fodiator*, in the eastern Pacific.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Transitional water and marine. Pelagic over lagoon and seaward reefs, at depths of 0–13 m. Outside the area, worldwide in tropical and warm temperate oceans, except for eastern Pacific.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, EUT. Sensitive to human activities. Keystone species. Significant decline. Low priority for conservation action.

### Poeciliidae – Poeciliids

*Gambusia holbrooki* Girard in Agassiz, 1859 – Holbrook's mosquitofish

Taxonomy. Recorded from Réunion by Fricke (1999: 114).

Distribution. Introduced into Réunion waters; not native of Réunion. Freshwater and transitional water. Outside the area, originally southeastern North America, introduced worldwide in tropical and warm temperate freshwater habitats.

Conservation. Not evaluated in Réunion (NE). No conservation scheme, as the species is not native.

*Poecilia reticulata* Peters, 1859 – Guppy; Guppy

Taxonomy. Recorded from Réunion by Starmühlner (1979: 671).

Distribution. Introduced into Réunion waters; not native of Réunion. Freshwater and transitional water. Outside the area, originally South America from Venezuela and Guayanas to northeastern Brazil, Trinidad and Barbados, introduced worldwide in tropical and warm temperate freshwater habitats.

Conservation. Not evaluated in Réunion (NE). No conservation scheme, as the species is not native.

*Xiphophorus hellerii* Heckel, 1848 – Green swordtail; Porte-épée

Taxonomy. Recorded from Réunion by Marquet et al. (1997: 29); record confirmed by Fricke (1999: 114), based on LEMUR and MHNRUN material.

Distribution. Introduced into Réunion waters; not native of Réunion. Freshwater and transitional water. Outside the area, originally Mexico, introduced worldwide into tropical freshwater habitats.

Conservation. Not evaluated in Réunion (NE). No conservation scheme, as the species is not native.

*Xiphophorus maculatus* (Günther, 1866) – Southern platyfish

Taxonomy. Recorded from Réunion by Starmühlner (1979: 670, 674); record confirmed by Fricke (1999: 115), based on MHNRUN material.

Distribution. Introduced into Réunion waters; not native of Réunion. Freshwater and transitional water. Outside the area, originally Mexico, introduced worldwide into tropical freshwater habitats.

Conservation. Not evaluated in Réunion (NE). No conservation scheme, as the species is not native.

### Monocentridae – Pineapple fishes

*Monocentris japonica* (Houttuyn, 1782) – Pinecone fish, pineapple fish; Poisson ananas

Taxonomy. First record from Réunion by Fricke (1999: 124–125), based on MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Comores, Madagascar. Marine species. Found under ledges and in caves of rocky reefs, at depths of 10–200 m. Outside the area, Red Sea, East and South Africa east to Philippines, north to Korea, southern Japan and Ogasawara Islands, south to South Australia, Kermadec Islands and northern New Zealand.

Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitivity to human activities unknown. Decline unknown. Low priority for conservation action.

### Anomalopidae – Flashlight fishes

*Photoblepharon steinitzi* Abe & Haneda, 1973 – Blue-lined flashlight fish

Taxonomy. First record from Réunion and the Mascarenes by Fricke (1999: 125).

Distribution. Réunion, Comores. Marine species. Found during the day in deep rock caves at 300–500 m, ascending to the coral reef at 0–20 m during the night. Outside the area, Red Sea east to Maldives.

Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT, HAB. Sensitive to human activities. Decline unknown. Low priority for conservation action.

### Berycidae – Berycids

*Beryx decadactylus* Cuvier in Cuvier & Valenciennes, 1829 – Alfonsino; Beryx commun

Taxonomy. First record from Réunion by Fricke (1999: 125), based on MHNRUN material.

Distribution. Réunion, Mauritius, Madagascar Ridge, Comores, Seychelles. Marine species. Bathydemersal on sand and mud bottoms, at depths of 110–1000 m. Outside the area, antiequatorial in Atlantic and western Indian Oceans, Korea and Japan to Hawaiian Islands, New Guinea and Australia to northern New Zealand.

Conservation. Data deficient in Réunion (DD). Threats: FIT, FIB. Sensitive to human activities. Probable decline. Medium priority for conservation action.

### Trachichthyidae – Roughies

Remarks. *Hoplostethus* sp. was recorded from Réunion by Durville et al. (submitted), based on MHNRUN material (**new record** for the family).

Holocentridae – Squirrelfishes and soldierfishes

*Myripristis adusta* Bleeker, 1853 – Shadowfin soldier; Marignan ombré

Taxonomy. First record from Réunion by Chabanet (1994: 237).

Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles. Marine species. Found in coral-rich areas of drop-offs and steep channel slopes, and also on rocky reefs, hiding in holes and crevices during the day, at depths of 1–25 m. Outside the area, Red Sea, East and South Africa east to Line and Tuamotu islands, north to Ryukyu Islands, south to Port Hedland/Western Australia, New Caledonia, Tonga and Austral Islands.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action.

*Myripristis berndti* Jordan & Evermann, 1903 – Blotcheye soldierfish, bigscale soldierfish; Cardinal (Réunion), marignan à œillères (France)

Taxonomy. First record from Réunion by Randall & Guézé (1981: 12–13); record confirmed by Fricke (1999: 127), based on BPBM, LEMUR and SMNS material.

Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Found in coral-rich areas of subtidal reef flats, channels and margins of outer reef slopes, and also on rocky reefs, hiding in holes and crevices during the day, at depths of 1–50 m. Outside the area, Red Sea, East and South Africa east to Costa Rica, north to Ryukyu, Ogasawara and Midway islands, south to Western Australia at 22°S, Lord Howe and Kermadec islands, and Rapa.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Myripristis botche* Cuvier, 1829 – Blacktip soldierfish; Marignan poklé

Taxonomy. **New record** from Réunion, based on a specimen observed during a visual census on the outer coral reef, in 2004 (T. Mulochau, P. Durville, E. Tessier, P. Chabanet).

Distribution. Réunion, Rodrigues. Marine species. Found in coral reefs, hiding in holes and crevices during the day, at depths of 25–71 m. Outside the area, Red Sea, East and South Africa east to Philippines, north to Ryukyu Islands, south to New Caledonia.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Myripristis chryseres* Jordan & Evermann, 1903 – Yellowfin soldierfish; Cardinal queue jaune (Réunion)

Taxonomy. First record from Réunion by Randall (1982: 200); previously listed by Bleeker (1873a: 94–96) as *M. borbonicus* (non Valenciennes in Cuvier & Valenciennes, 1831); record confirmed by Fricke (1999: 127–128), based on BPBM, LEMUR, MNHN and RMNH material.

Distribution. Réunion, Mauritius, Comores. Marine species. Found on steep outer reef slopes, hiding in holes and crevices during the day, at depths of 12–240 m. Outside the area, Red Sea and Natal/South Africa east to Hawaiian and Society islands, north to southern Japan, Ogasawara Islands and Midway Atoll, south to Queensland/Australia at 15°50'S.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Myripristis hexagona* (Lacepède, 1802) – Doubletooth soldierfish; Marignan à deux dents

Taxonomy. First record from Réunion by Bleeker (1874: 86) as *M. hexagonus*; record confirmed by Fricke (1999: 128), based on MNHN material.

Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Found in coral reefs, hiding in holes and crevices during the day, at depths of 1–40 m. Outside the area, South and East Africa east to Samoa and Tonga, north to Ryukyu and Ogasawara islands, south to Western Australia at 20°29'S, Queensland/Australia and New Caledonia.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Myripristis kuntee* Valenciennes in Cuvier & Valenciennes, 1831 – Shoulderbar soldierfish, epaulette soldierfish, pearly soldierfish; Marignan ardoisé

Taxonomy. First record from Réunion by Blanc & Postel (1958: 368, 373); previously described as *M. borbonius* (not *borbonicus* as stated by subsequent authors) by Valenciennes in Cuvier & Valenciennes (1831: 489), and listed by Sauvage (1891: 5–6) as *M. seychellensis*; record confirmed by Fricke (1999: 128–129), based on BPBM and MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Marine species. Found in coral reefs, hiding in holes and crevices during the day, at depths of 5–40 m. Outside the area, east to Hawaiian and Marquesas islands, north to southern Japan and Ogasawara Islands, south to Western Australia, Lord Howe Island, and Tonga.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Myripristis murdjan* (Forsskål in Niebuhr, 1775) – Pinecone soldierfish, blotcheye soldier, red soldierfish; Cardinal gros écailles (Réunion), marignan pomme de pin (France)

Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 90) as *M. murdjan* and *M. bowditchae*; record confirmed by Fricke (1999: 129–130), based on LEMUR, MNHN and SMNS material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Found on subtidal reef flats, channels and margins of outer reef slopes, and also on rocky reefs, hiding in holes and crevices during the day, at depths of 0–50 m. Outside the area, Red Sea, East and South Africa east to Wake Atoll, Midway Atoll, Samoa and Tonga, north to Ryukyu Islands, south to Point Quobba/Western Australia, New South Wales/Australia and New Caledonia.

Conservation. Near threatened in Réunion (NT). Threats: FIT, HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Myripristis seychellensis* Cuvier in Cuvier & Valenciennes, 1829 – Seychelles soldier

Taxonomy. First record from Réunion by Randall & Guézé (1981: 10–11).

Distribution. Réunion, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Found in coral reefs, hiding in holes and crevices during the day, at depths of 2–21 m. Endemic to islands in the southwestern Indian Ocean.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Very sensitive to human activities. Probable decline. High priority for conservation action.

*Myripristis vittata* Valenciennes in Cuvier & Valenciennes, 1831 – Immaculate soldier, white-tipped soldierfish; Cardinal petit écailles (Réunion)

Taxonomy. First record from Réunion by Biais & Taquet (1992: 75); previously listed by Sauvage (1891: 12–15) as *M. seychellensis* (part: non Cuvier in Cuvier & Valenciennes, 1829); record confirmed by Fricke (1999: 131), based on BPBM, MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Found in coral reefs, hiding in holes and crevices during the day, at depths of 3–80 m. Outside the area, East Africa east to Hawaiian and Marquesas islands, north to southern Japan and Ogasawara Islands, south to Western Australia, Queensland/Australia, New Caledonia and Tonga.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Very sensitive to human activities. Probable decline. High priority for conservation action.

*Neoniphon aurolineatus* (Liénard, 1839) – Yellow-striped squirrelfish; Marignan à bandes jaunes

Taxonomy. First record from Réunion by Randall & Heemstra (1985: 3–4); previously listed by Fourmanoir & Guézé (1962b: 7) as *Holocentrus anjouanae*; record of *Neoniphon aurolineatus* confirmed by Fricke (1999: 131–132), based on BPBM and MNHN material.

Distribution. Réunion, Mauritius, Comores, Madagascar, Aldabra. Marine species. Living on outer reef slopes, at depths of 30–160 m, during the day in caves, during the night outside feeding on plankton. Outside the area, Maldives east to Hawaiian and Marquesas islands, north to southern Japan and Ogasawara Islands, south to northern Great Barrier Reef/ Australia.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Neoniphon opercularis* (Valenciennes in Cuvier & Valenciennes, 1831) – Blackfin squirrelfish; Marignan aile noire

Taxonomy. **New record** from Réunion, based on specimens observed and photographed during a visual census on the outer and inner coral reef, in 2004 (T. Mulochau, P. Durville, E. Tessier, P. Chabanet).

Distribution. Réunion, Cargados Carajos. Marine species. Found in coral and rocky reefs, at depths of 1–25 m. Outside the area, East Africa east to Line Islands, north to Ryukyu Islands, south to New Caledonia.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Decline unknown. Low priority for conservation action.

*Neoniphon sammara* (Forsskål in Niebuhr, 1775) – Bloodspot squirrelfish; Marignan tacheté

Taxonomy. First record from Réunion by Guichenot (1863: C24) as *Holocentrum sammara*; record confirmed by Fricke (1999: 132–133), based on LEMUR and MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Found in seagrass beds and hard bottom habitats on lagoon and seaward coral and rocky reefs, often associated with branching *Acropora* coral, at depths of 0–46 m. Outside the area, Red Sea and East Africa east to Line Islands and Pitcairn Group, north to southern Japan, Ogasawara and Hawaiian islands, south to Western Australia at 20°33'S, Lord Howe Island, Tonga and Rapa.

Conservation. Near threatened in Réunion (NT). Threats: FIT, HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Ostichthys archiepiscopus* (Valenciennes, 1862) – Longsnout soldier; Cardinal (Réunion), marignan cuirassé (France)

Taxonomy. Originally described from Réunion by Valenciennes (1862: 1169–1170); subsequently listed by Guichenot (1863: C24) as *Myripristis japonicus* (non Cuvier in Cuvier & Valenciennes, 1829); record confirmed by Fricke (1999: 133–134), based on MNHN material.

Distribution. Réunion, Mauritius. Marine species. Bathydemersal, at depths of 146–400 m. Outside the area, Ryukyu, Ogasawara, Hawaiian and Society islands, probably more widespread.

Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitivity to human activities unknown. Decline unknown. Low priority for conservation action.

*Ostichthys delta* Randall, Shimizu & Yamakawa, 1982 – Redcoat

Taxonomy. Originally described from Réunion by Randall et al. (1982: 18, fig. 11); record confirmed by Fricke (1999: 134), based on BPBM, MNHN and USNM material.

Distribution. Réunion, Comores. Marine species. Found on deep reefs, known from depths of 150–200 m. Outside the area, Samoa, probably more widespread.

Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Local importance. Sensitivity to human activities unknown. Decline unknown. Medium priority for conservation action.

*Ostichthys kaianus* (Günther, 1880) – Kai soldierfish, deepwater soldier; Lancette de creux (Réunion)

Taxonomy. First record from Réunion by Randall & Heemstra in Smith & Heemstra (1986: 426); previously described as *Myripristis (Holotrachys) guezei* by Postel (1962: 158–161, figs. 1–2); record confirmed by Fricke (1999: 134), based on MHNRUN and MNHN material.

Distribution. Réunion, Comores. Marine species. Living on deep reefs, known from depths of 310–640 m. Outside the area, Indonesia east to Mariana Islands and Samoa, north to Ryukyu Islands, south to Shark Bay/Western Australia and Loyalty Islands.

Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitivity to human activities unknown. Decline unknown. Low priority for conservation action.

*Pristilepis oligolepis* (Whitley, 1941) – Spinyface soldierfish

Taxonomy. First record from Réunion by Randall & Heemstra in Smith & Heemstra (1986: 426–427).

Distribution. Réunion. Marine species. Living on deeper reefs, known from depths of 14–220 m. Outside the area, Western Australia, Japan and Ogasawara Islands, Hawaiian Islands, Lord Howe Island, Easter Island. Probably more widespread.

Conservation. Data deficient in Réunion (DD). Threats: FIT, FIB, HAB, EUT. Sensitive to human activities. Decline unknown. Low priority for conservation action.

*Sargocentron caudimaculatum* (Rüppell, 1838) – Silverspot squirrelfish, tailspot squirrelfish; Marignan rouge et argent

Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 89) as *Holocentrus caudimaculatus*.

Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles. Marine species. Found in outer coral reef areas, also in lagoons and around drop-offs, at depths of 2–40 m. Outside the area, Red Sea, East Africa and Transkei/South Af-

rica east to Hawaiian Islands and Pitcairn Group, north to southern Japan and Minami Tori Shima, south to Western Australia at 17°30'S, Queensland/Australia, New Caledonia and Tonga.

Conservation. Near threatened in Réunion (NT). Threats: FIT, HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Sargocentron diadema* (Lacepède [ex Commerson], 1802) – Crown squirrelfish; Soldat couronné

Taxonomy. First record from Réunion by HARMELIN-VIVIEN (1976: 90) as *Holocentrus diadema*; record confirmed by FRICKE (1999: 135–137), based on BPBM, MNHN and SMNS material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Found in shallow coral and rocky reefs, including tidal pools, at depths of 0–60 m. Outside the area, Red Sea, East and South Africa east to Hawaiian Islands and Pitcairn Group, north to Ryukyu and Ogasawara islands, south to Western Australia at 17°30'S, Elizabeth and Middleton Reefs, and Austral Islands.

Conservation. Near threatened in Réunion (NT). Threats: FIT, HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Sargocentron inaequalis* Randall & Heemstra, 1985 – Lattice squirrelfish

Taxonomy. First record from Réunion by RANDALL (1998: 34–35, fig. 12); record confirmed by FRICKE (1999: 137), based on MNHN material. Also MHNRUN material.

Distribution. Réunion, Comores, Seychelles. Marine species. Found in coral reefs, at depths of 6–20 m. Outside the area, Chagos Archipelago, Line Islands. Probably more widespread.

Conservation. Vulnerable in Réunion (VU). Threats: HAB, EUT. Very sensitive to human activities. Probable decline. High priority for conservation action.

*Sargocentron ittodai* (Jordan & Fowler, 1902) – Samurai squirrelfish

Taxonomy. First record from Réunion by RANDALL & HEEMSTRA (1985: 10–11); record confirmed by FRICKE (1999: 137), based on BPBM and RMNH material.

Distribution. Réunion, Mauritius, Comores, Seychelles. Marine species. Found on outer coral reef slopes, at depths of 2–70 m. Outside the area, Red Sea and Natal/South Africa east to Marquesas Islands, south to New South Wales/Australia.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Sargocentron melanospilos* (Bleeker, 1858) – Blackblotch squirrelfish; Beauclaire

Taxonomy. First record from Réunion by FRICKE (1999: 138), based on MNHN material. Also MHNRUN material.

Distribution. Réunion. Marine species. Found in coral and rocky reefs, at depths of 5–90 m. Outside the area, Comores and Seychelles east to Wake Atoll, Marshall Islands, Samoa and Tonga, north to Ryukyu and Ogasawara islands, south to Western Australia, Queensland/Australia and New Caledonia.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Sargocentron punctatissimum* (Cuvier in Cuvier & Valenciennes, 1829) – Speckled squirrelfish

Taxonomy. First record from Réunion by LETOURNEUR (1991: 164); previously listed by HARMELIN-VIVIEN (1976: 90) as *Holocentrus lacteoguttatus*; record of *Sargocentron punctatissimum* confirmed by FRICKE (1999: 138–139), based on LEMUR, MHNRUN, MNHN, SMNS and USNM material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Found in coral and rocky reefs including lagoon habitats and tidal pools, at depths of 0–183 m. Outside the area, Red Sea, East and South Africa east to Hawaiian and Easter islands, north to southern Japan and Ogasawara Islands, south to Western Australia at 17°30'S, New Caledonia and Rapa.

Conservation. Least concern in Réunion (LC). Threats: FIT, HAB, EUT. Sensitive to human activities. Stable populations. Low priority for conservation action.

*Sargocentron seychellense* (Smith & Smith, 1963) – Seychelles squirrelfish, yellow-tipped squirrelfish

Taxonomy. First record from Réunion by FRICKE (1999: 139–140); previously described in part from Réunion by LACEPÈDE (1802: 253, 273–276) as *Centropomus ruber*, a secondary homonym of *Sciaena rubra* Forsskål in Niebuhr, 1775.

Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Found in shallow waters of coral reefs and rocky shores, often between branching corals, at depths of 0–20 m. Outside the area, Oman, Chagos Archipelago. Endemic to islands in the tropical southwestern Indian Ocean.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Sargocentron spiniferum* (Forsskål in Niebuhr, 1775) – Sabre squirrelfish, long-jawed squirrelfish; Cardinal lancette (Réunion), marignan sabre (France)

Taxonomy. First record from Réunion by BLEEKER (1874: 86) as *Holocentrum spiniferum*; previously listed by GUICHENOT (1863: C24) as *Holocentrum leo*; record confirmed by FRICKE (1999: 140–141), based on LEMUR, MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Found in coral reefs from reef flats to lagoon and seaward reefs, at depths of 1–122 m. Outside the area, Red Sea, East and South Africa east to Hawaiian Islands and Pitcairn Group, north to southern Japan and Ogasawara Islands, south to Western Australia at 17°30'S, Queensland/Australia, New Caledonia and Rapa.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Very sensitive to human activities. Probable decline. High priority for conservation action.

*Sargocentron tiere* (Cuvier in Cuvier & Valenciennes, 1829) – Red squirrelfish, blue-lined squirrelfish

Taxonomy. First record from Réunion by LETOURNEUR (1992: unpag. 1); record confirmed by FRICKE (1999: 141–142), based on MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Marine species. Found along exposed reef margins and outer reef slopes, at depths of 1–183 m. Outside the area, east to Hawaiian Islands and Pitcairn Group, north to southern Japan and Ogasawara Islands, south to Western Australia at 21°40'S, Queensland/Australia at 15°50'S, New Caledonia, Tonga, and Austral Islands.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Sargocentron tiereoides* (Bleeker, 1853) – Pink squirrelfish
Taxonomy. First record from Réunion by Durville et al. (submitted), based on MHNRUN material.
Distribution. Réunion, Comores. Marine species. Found on outer reef slopes, on the reef flat and lagoon patch reefs, at depths of 3–46 m. Outside the area, East Africa east to Hawaiian, Line and Tuamotu islands, north to Ryukyu and Wake islands, south to Vanuatu and Tonga.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

### Grammicolepididae – Tinselfishes

*Xenolepidichthys dalgleishi* Gilchrist, 1922 – Spotted tinselfish
Taxonomy. **New record** from Réunion, based on photographed specimens collected by local fishermen, off Saint-Paul, at 450 m depth, in 2008 (P. Durville, T. Mulochau).
Distribution. Réunion. Marine species. Benthopelagic, at depths of 200–885 m. Outside the area, tropical Atlantic and Indo-West Pacific oceans.
Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitive to human activities. Decline unknown. Low priority for conservation action.

### Pegasidae – Seamoths

*Eurypegasus draconis* (Linné, 1766) – Short dragonfish; Pégase dracon
Taxonomy. First record from Réunion by Guichenot (1863: C30) as *Pegasus draco*; record confirmed by Fricke (1999: 142–143), based on MHNRUN and MNHN material.
Distribution. Réunion, Mauritius, Madagascar. Transitional water and marine. Found in lagoons, often among algal or seagrass beds, mainly on mud or sand bottom and in estuaries, at depths of 1–91 m (Réunion: 1–20 m). Outside the area, Red Sea and East Africa east to Marshall and Marquesas islands, north to southern Japan, south to Dampier Archipelago/Western Australia, New South Wales/Australia and Lord Howe Island.
Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

### Aulostomidae – Trumpetfishes

*Aulostomus chinensis* (Linné, 1766) – Chinese trumpetfish; Poisson trompette
Taxonomy. First record from Réunion by Guichenot (1863: C28) as *Aulostoma Chinensis*; subsequently listed by Fourmanoir & Guézé (1963: 8) as *Aulostomus valentini*; record confirmed by Fricke (1999: 143–144), based on LEMUR, MHNRUN, SMNS and USNM material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Marine species. Found in coral and rocky reefs, at depths of 2–122 m. Outside the area, South and East Africa east to Panama, north to southern Japan and Ogasawara, Hawaiian, Johnston and Easter islands, south to Western Australia at 31°52'S, Lord Howe and Kermadec islands, and Rapa.
Conservation. Data deficient in Réunion (DD). Threats: FIT, FIB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

### Syngnathidae – Seahorses and pipefishes

*Choeroichthys sculptus* (Günther, 1870) – Sculptured pipefish
Taxonomy. First record from Réunion by Letourneur et al. (2004: 210), based on a specimen collected in Saint-Gilles Harbour, and kept alive for a year in Saint-Gilles Aquarium.
Distribution. Madagascar, Aldabra. Marine species. Found on reef flats and seagrass areas, including tidal pools; at depths of 0–9 m. Outside the area, East Africa to Line, Society and Gambier islands, north to southern Japan, south to Tonga.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Choeroichthys valencienni* (Kaup, 1856) – Indian Ocean short-bodied pipefish
Taxonomy. First record from Réunion by Günther (1870: 187) as *Doryichthys valenciennii*; subsequently listed by Bleeker (1874: 75) as *Doryichthys brachysoma* (non Bleeker, 1855); record confirmed by Fricke (1999: 147) as *Choeroichthys brachysoma* (non Bleeker, 1855), based on SMNS material. Taxonomic decision of Kuiter (2000: 144).
Distribution. Réunion, Mauritius, Madagascar, Aldabra, Amirantes. Marine species. Found in coral reefs and seagrass areas, including tidal pools; at depths of 0–25 m. Outside the area, Red Sea and East Africa.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Corythoichthys flavofasciatus* (Rüppell, 1838) – Network pipefish
Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 90) as *Corithoichthys flavofasciatus*; record confirmed by Fricke (1999: 147–148), based on SMNS and USNM material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Amirantes. Marine species. Found among algal-matted rock and living corals of lagoon and seaward coral and rocky reefs, at depths of 0–25 m. Outside the area, Red Sea and East Africa east to Indonesia.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Corythoichthys haematopterus* (Bleeker, 1851) – Bloodspot pipefish, reef-top pipefish
Taxonomy. First record from Réunion by Fricke (1999: 148), based on LEMUR, MHNRUN and SMNS material; previously listed by Guichenot (1863: C30) as *Corythoichthys fasciatus* (sensu Gray, 1830; non Risso, 1810).
Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Found in shallow protected areas of rubble and sand, usually semi-silty zones, associated with coral or rocky reefs, at depths of 0–21 m. Outside the area, East Africa east to Palau/Belau and Vanuatu north to southern Japan, south to northwestern Australia and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Corythoichthys schultzi* Herald in Schultz, Herald, Lachner, Welander & Woods, 1953 – Guilded pipefish
Taxonomy. First record from Réunion by LETOURNEUR (1992: unpag. 1); previously listed by HARMELIN-VIVIEN (1976: 90) as *Corythoichthys* cf. *schultzi*.
Distribution. Réunion, Mauritius, Comores, Seychelles. Marine species. Found among corals or sea fans in lagoon and seaward reefs, occasionally also in rocky reefs, at depths of 2–30 m. Outside the area, Red Sea, East Africa east to Marshall Islands and Tonga, south to Rowley Shoals/Western Australia and Queensland/Australia.
Conservation. Data deficient in Réunion (DD). Threats: HAB, HOS, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Doryrhamphus bicarinatus* (Dawson, 1981) – Indian Ocean bluestripe pipefish
Taxonomy. **New record** from Réunion; previously listed by HARMELIN-VIVIEN (1976: 90) as *D. melanopleura* (non Bleeker, 1858), by LETOURNEUR (1991: 164) as *D. excisus* (non Kaup, 1856), and by FRICKE (1999: 149–150) as *D. excisus excisus* (non Kaup, 1856), based on LEMUR, SMNS and USNM material. Taxonomic decision of KUITER (2000: 92).
Distribution. Réunion, Mauritius, Rodrigues, Comores, Cargados Carajos, Aldabra, Amirantes. Marine species. Found in shallow lagoon and coral and rocky reef areas, including tidal pools; at depths of 0–20 m. Outside the area, East and South Africa east to Andaman Sea.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Dunckerocampus multiannulatus* (Regan, 1903) – Many-banded pipefish
Taxonomy. First record from Réunion by LETOURNEUR et al. (2004: 204).
Distribution. Réunion, Mauritius, Seychelles. Marine species. Found among coral and in reef caves and crevices, at depths of 3–45 m. Outside the area, Red Sea, East and South Africa east to Sumatera/Indonesia.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Halicampus mataafae* (Jordan & Seale, 1906) – Samoan pipefish
Taxonomy. First record from Réunion by DAWSON (1985: 89–90); record confirmed by FRICKE (1999: 150), based on BPBM material.
Distribution. Réunion, Mauritius, Aldabra, Agalega Islands, Cargados Carajos. Marine species. Found in coral and rocky reefs including tidal pools, at depths of 0–15 m. Outside the area, Red Sea, East and South Africa east to Marshall Islands, Samoa and Tonga, north to Taiwan and Palau/Belau, south to Queensland/Australia at 15°28'S, Chesterfield Islands and Tonga.
Conservation. Vulnerable in Réunion (VU). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Hippocampus borboniensis* Duméril, 1870 – Réunion seahorse
Taxonomy. Originally described from Réunion by DUMÉRIL (1870: 520); listed by FRICKE (1999: 152) as *H. whitei* (non Bleeker, 1855), based on MNHN material. Taxonomic decision of LOURIE et al. (1999: 79).
Distribution. Réunion, Madagascar, Seychelles. Marine species. Found on soft bottoms and on sponges, at depths of 3–60 m. Outside the area, East and South Africa east to Maldives.
Conservation. Endangered in Réunion (EN). Threats: HAB, EUT (FIT in other areas). Sensitive to human activities. Severe decline. High priority for conservation action. Proposed for Annexes II and IV of the EU Habitats Directive, as a prioritary species.

*Hippocampus jayakari* Boulenger, 1900 – Spiny seahorse; Hippocampe épineux
Taxonomy. **New record** from Réunion; previously listed by GUICHENOT (1863: C30) as *H. hystrix* (non Kaup, 1856), by BLEEKER (1874: 76) as *H. guttulatus* (non Cuvier, 1829), and by FRICKE (1999: 151) as *H. histrix* (non Kaup, 1856), based on MNHN material. Taxonomic decision of KUITER (2000: 31).
Distribution. Réunion, Mauritius, Seychelles. Marine species. Found on rubble-algae habitats and on soft bottoms on sponges, at depths of 3–20 m. Outside the area, Red Sea and East Africa east to Maldives.
Conservation. Endangered in Réunion (EN). Threats: HAB, EUT (FIT in other areas). Rare. Sensitive to human activities. Severe decline. High priority for conservation action. Proposed for Annexes II and IV of the EU Habitats Directive, as a prioritary species.

*Microphis millepunctatus* (Kaup, 1856) – Shorttail pipefish; Syngnathe (Réunion)
Taxonomy. Originally described from Réunion by KAUP (1856b: 60) as *Doryichthys millepunctatus*; subsequently listed by DUMÉRIL (1870: 595–596) as *Microphis brachyurus*; record confirmed by FRICKE (1999: 152–153) as *M. brachyurus millepunctatus*, based on MHNRUN and MNHN material. Taxonomic decision (raising the subspecies to species level) of the present paper.
Distribution. Réunion, Mauritius, Madagascar. Freshwater and transitional water. Found in brackish estuaries and lower reaches of freshwater streams. Outside the area, East and South Africa.
Conservation. Data deficient in Réunion (DD). Threats: EUT, CON. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Nannocampus pictus* (Duncker, 1915) – Reef pipefish
Taxonomy. First record from Réunion by FRICKE (1999: 153), based on SMNS material.
Distribution. Réunion, Mauritius. Marine species. Found on mixed sand and seagrass habitats adjacent to coral reefs, including tidal pools, at depths of 0–10 m. Outside the area, South and East Africa east to Queensland/Australia (south to 24°30'S), north to Sri Lanka.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Trachyrhamphus bicoarctatus* (Bleeker, 1857) – Double-ended pipefish
Taxonomy. First record from Réunion by LETOURNEUR et al. (2004: 204).
Distribution. Réunion, Mauritius, Madagascar. Marine species. Found in subtidal lagoon and seaward reefs, usually among algae or seagrass, at depths of 1–42 m. Outside the area, Red Sea and East Africa east to Mariana Islands and New Caledonia, north to southern Japan.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

### Fistulariidae – Flutemouths

*Fistularia commersonii* Rüppell, 1838 – Blue-spotted cornetfish; Trompette (Réunion), cornette à taches bleues (France)

Taxonomy. First record from Réunion by Letourneur (1998: 282); previously listed by Guichenot (1863: C28) as *F. tabaccaria* (non Linnaeus, 1758); record confirmed by Fricke (1999: 144–145), based on MNHN and SMNS material. Also MHNRUN material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar. Marine species. Found in coral and rocky reefs, and on sand bottoms adjacent to reefs, at depths of 0–128 m. Outside the area, Ascension Island, Red Sea, East and South Africa east to Panama, north to southern Japan, Ogasawara and Hawaiian islands, south to Western Australia at 19°09'S, New Zealand and Rapa, immigrated into the Mediterranean Sea through Suez Canal.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Fistularia petimba* Lacepède [ex Commerson], 1803 – Red cornetfish, serrate flutemouth; Trompette (Réunion), cornette rouge (France)

Taxonomy. Originally described from Réunion by Lacepède (1803: 349–355); record confirmed by Fricke (1999: 145), based on MNHN material. Also MHNRUN material.

Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles. Marine species. Found above soft bottoms adjacent to coral and rocky reefs, at depths of 10–200 m. Outside the area, Red Sea, East and South Africa east to Panama, north to southern Japan and Ogasawara Islands, south to Victoria/Australia and New Caledonia; also tropical Atlantic Ocean.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

### Solenostomidae – Ghost pipefishes

*Solenostomus cyanopterus* Bleeker, 1854 – Ghost pipefish

Taxonomy. First record from Réunion by Fritzsche in Smith & Heemstra (1986: 459); record confirmed by Fricke (1999: 145–146), based on BPBM material.

Distribution. Réunion, Mauritius, Comores, Madagascar. Marine species. Found in coastal coral reefs and adjacent lagoons, at depths of 0–25 m. Outside the area, Red Sea, East and South Africa east to Mariana Islands, north to southern Japan, south to Shark Bay/Western Australia and New Caledonia.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Solenostomus paradoxus* (Pallas, 1770) – Ghost pipefish

Taxonomy. First record from Réunion by Fricke (1999: 146), based on an underwater photograph.

Distribution. Réunion, Mauritius, Comores. Marine species. Found in or adjacent to coral reefs among branches of gorgonians, floating weeds, or crinoids, at depths of 0–20 m. Outside the area, East Africa east to Marshall Islands, Fiji and Tonga, north to southern Japan, south to Western Australia at 17°06'S and New Caledonia.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

### Dactylopteridae – Flying gurnards

*Dactyloptena orientalis* (Cuvier, 1829) – Common helmet gurnard; Poisson volant (Réunion), grondin volant (France)

Taxonomy. First record from Réunion by Guichenot (1863: C24) as *Dactylopterus orientalis* and *Cephalacanthus spinarella* (non Linnaeus, 1758); listed by Bleeker (1874: 76) as *Corystion volitans* (non Linnaeus, 1758); record of *Dactyloptena orientalis* confirmed by Fricke (1999: 168–169), based on MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Marine species. Benthic, on sandy substrates adjacent to coral reefs, at depths of 1–100 m. Outside the area, South and East Africa to Hawaiian Islands and Pitcairn Group, north to southern Japan and Ogasawara Islands, south to Western Australia, New South Wales/Australia, New Caledonia, Tonga and Rapa.

Conservation. Data deficient in Réunion (DD). Threats: FIT, FIB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Dactyloptena peterseni* (Nyström, 1887) – Starry helmet gurnard; Poisson volant (Réunion)

Taxonomy. First record from Réunion and the Mascarenes by Fricke (1999: 169), based on MHNRUN and MNHN material.

Distribution. Réunion. Marine species. Benthic on soft bottoms, at depths of 50–210 m. Outside the area, East and South Africa east to Japan and Ogasawara Islands, south to northern Australia.

Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitivity to human activities unknown. Decline unknown. Low priority for conservation action.

### Setarchidae – Deepwater scorpionfishes

*Setarches longimanus* (Alcock, 1894) – Redsmooth scorpionfish

Taxonomy. First record from Réunion by Durville et al. (submitted), based on MHNRUN material.

Distribution. Réunion. Marine species. Bathydemersal, at depths of 180–704 m. Outside the area, Andaman Islands east to Philippines, north to southern Japan, south to northwestern Australia, Queensland/Australia, and New Caledonia.

Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitivity to human activities unknown. Decline unknown. Low priority for conservation action.

### Scorpaenidae – Scorpionfishes

*Caracanthus madagascariensis* (Guichenot, 1869) – Spotted croucher

Taxonomy. First record from Réunion by Letourneur (1992: 53, unpag. 2); previously listed by Harmelin-Vivien (1976: 91) as *C. maculatus* (non Gray, 1831).

Distribution. Réunion, Mauritius, Comores, Madagascar, Aldabra, Agalega Islands, Cargados Carajos. Marine species. Found in coral reefs, associated with and among live *Acropora* corals, at depths of 0–22 m. Outside the area, Sodwana Bay/South Africa and East Africa east to Maldives and Chagos Archipelago.

Conservation. Vulnerable in Réunion (VU). Threats: HAB, HOS, EUT. Rare. Very sensitive to human activities. Significant decline. High priority for conservation action.

*Caracanthus unipinna* (Gray, 1831) – Pygmy coral croucher
Taxonomy. First record from Réunion by FRICKE (1999: 168), based on underwater observations.
Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles. Marine species. Found in coral reefs, associated with and among live *Acropora* and *Stylophora* corals, at depths of 0–20 m. Outside the area, South and East Africa east to Pitcairn Group, north to southern Japan and Ogasawara Islands, south to Western Australia, Great Barrier Reef/Australia at 23°30'S, Loyalty Islands, Tonga and Rapa.
Conservation. Data deficient in Réunion (DD). Threats: HAB, HOS, EUT. Rare. Very sensitive to human activities. Probable decline. Medium priority for conservation action.

*Dendrochirus biocellatus* (Fowler, 1938) – Twinspot lionfish, ocellated lionfish
Taxonomy. First record from Réunion by PARMENTIER (1988: I).
Distribution. Réunion, Mauritius. Marine species. Found in coral reefs, secretive during the day, at depths of 1–40 m. Outside the area, Maldives and Sri Lanka east to Mariana and Tuamotu islands, north to southern Japan, south to northwestern Australian shelf, New Caledonia and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Very sensitive to human activities. Probable decline. Medium priority for conservation action.

*Dendrochirus brachypterus* (Cuvier in Cuvier & Valenciennes, 1829) – Dwarf lionfish
Taxonomy. **New record** from Réunion, based on specimen observed and photographed during a visual census, in Saint-Paul Bay, at 12 m depth, in 2008 (T. MULOCHAU, P. DURVILLE).
Distribution. Réunion. Marine species. Found in coral and rocky reefs, on reef flats and in shallow lagoons, in areas with weed-covered rocks on sandy substrates, at depths of 0–68 m. Outside the area, Red Sea, East and South Africa east to Hawaiian Islands, north to southern Japan, south to Lord Howe Island.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Decline unknown. Low priority for conservation action.

*Dendrochirus zebra* (Cuvier in Cuvier & Valenciennes, 1829) – Zebra lionfish, zebra turkeyfish; Poisson armée (Réunion)
Taxonomy. First record from Réunion by GUICHENOT (1863: C25) as *Pterois zebra*; record confirmed by FRICKE (1999: 155), based on LEMUR, MNHN, SMNS and USNM material.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Marine species. Found on coral, rubble, or rock bottoms of reef flats, also in lagoon habitats, at depths of 2–80 m. Outside the area, Red Sea, East and South Africa east to Marshall Islands, Samoa and Tonga, north to southern Japan and Ogasawara Islands, south to Shark Bay/Western Australia, Lord Howe and Norfolk islands.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Inimicus filamentosus* (Cuvier in Cuvier & Valenciennes, 1829) – Filament-finned stinger; Poisson-pierre béquillard
Taxonomy. First record from Réunion by GUICHENOT (1863: C25) as *Pelor filamentosus*; record confirmed by FRICKE (1999: 155–156), based on MNHN material.
Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Found on sand and rubble bottoms near coral reefs, at depths of 5–55 m. Outside the area, Red Sea and East Africa east to Maldives.
Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Iracundus signifer* Jordan & Evermann, 1903 – Decoy scorpionfish
Taxonomy. First record from Réunion by FRICKE (1999: 156), based on underwater photographs.
Distribution. Réunion, Mauritius. Marine species. Benthic on sand and rubble under ledges of seaward coral reefs, at depths of 10–70 m. Outside the area, South Africa; Taiwan north to southern Japan; Hawaiian Islands; Cook Islands to Pitcairn Group, south to Rapa. Probably more widespread.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Parascorpaena mcadamsi* (Fowler, 1938) – Ocellated scorpionfish
Taxonomy. First record from Réunion and the Mascarenes by FRICKE (1999: 156), based on MNHN and SMNS material.
Distribution. Réunion, Comores. Marine species. Secretive in coral reefs, at depths of 0–70 m. Outside the area, South and East Africa east to Marshall Islands, north to Taiwan, south to Western Australia, Queensland/Australia, and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Very sensitive to human activities. Probable decline. Medium priority for conservation action.

*Pontinus tentacularis* (Fowler, 1938) – Tentacled scorpionfish
Taxonomy. First record from Réunion by FRICKE (1999: 157), based on SAIAB material; previously listed by FOURMANOIR & GUÉZÉ (1963: 19–20) as *Scorpaena* sp. nov.
Distribution. Réunion, Mauritius. Marine species. Bathydemersal on the slope, at depths of 170–600 m. Outside the area, east to Philippines and Kyushu-Palau Ridge.
Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Rare. Sensitivity to human activities unknown. Probable decline. Medium priority for conservation action.

*Pterois antennata* (Bloch, 1787) – Spotfin lionfish, broad-barred firefish; Poisson armée (Réunion)
Taxonomy. First record from Réunion by GUICHENOT (1863: C25); record confirmed by FRICKE (1999: 157–158), based on LEMUR and MNHN material.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Marine species. Found in crevices under rocks and coral formations of lagoon and seaward coral and rocky reefs, secretive during the day, at depths of 1–50 m. Outside the area, Red Sea, East and South Africa east to Wake Atoll, northern Line Islands and Pitcairn Group, north to southern Japan, south to Western Australia at 32°09'S, Sydney/New South Wales, Kermadec Islands and Rapa.
Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Pterois miles* (Bennett, 1828) – Devil firefish; Poisson armée (Réunion)
Taxonomy. First record from Réunion by PLAYFAIR & GÜNTHER (1867: IX); previously listed by CUVIER in CUVIER & VALENCIENNES (1829b: 352–361, part) as *P. volitans* (non Linnaeus, 1758), and on pp. 363–366 as *P. muricata*; record of *P. miles*

confirmed by FRICKE (1999: 158–159), based on MHNRUN, MNHN and SMNS material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Found in coastal waters in sand, mud, lagoon, coral and rocky reef habitats, at depths of 2–60 m. Outside the area, Red Sea, East and South Africa east to Sumatera/Indonesia.

Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté nº 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Rhinopias eschmeyeri* Condé, 1977 – Eschmeyer's scorpionfish

Taxonomy. First record from Réunion by MOTOMURA & JOHNSON (2006: 501–508), based on MNHN material.

Distribution. Réunion, Mauritius. Marine species. Found in coral reef habitats, at depths of 18–55 m. Outside the area, east to Vietnam, north to southern Japan, south to Queensland/Australia.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Very sensitive to human activities. Probable decline. Medium priority for conservation action.

*Rhinopias frondosa* (Günther, 1892) – Weedy scorpionfish

Taxonomy. First record from Réunion by FOURMANOIR & GUÉZÉ (1967: 56) as *Peoropsis frondosus*; record confirmed by FRICKE (1999: 159–160), based on MNHN material.

Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Found in coral reef habitats or adjacent sand bottoms, at depths of 13–90 m. Outside the area, East Africa east to Caroline Islands, north to southern Japan.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Very sensitive to human activities. Probable decline. Medium priority for conservation action.

*Scorpaenodes guamensis* (Quoy & Gaimard, 1824) – Guam scorpionfish; Rascasse de Guam

Taxonomy. First record from Réunion by LETOURNEUR (1991: 164); record confirmed by FRICKE (1999: 160), based on LEMUR, SMNS and USNM material.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar. Marine species. Found in rock crevices on coral and rocky reef flats, shallow lagoons, and channels, including tidal pools, at depths of 0–5 m. Outside the area, Red Sea, East and South Africa east to Wake, Marshall and Marquesas islands, north to southern Japan, south to northwestern Australia, Kermadec Islands, and Tonga.

Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Scorpaenodes kelloggi* (Jenkins, 1903) – Dwarf scorpionfish, Kellogg's scorpionfish

Taxonomy. First record from Réunion and the Mascarenes by FRICKE (1999: 160–161), based on SMNS material.

Distribution. Réunion, Agalega Islands. Marine species. Found in coralline areas from near shore to the outer reef slope, at depths of 0–45 m. Outside the area, South and East Africa east to Hawaiian and Marquesas islands, north to southern Japan, south to Western Australia and New Caledonia.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Scorpaenodes minor* (Smith, 1958) – Minor scorpionfish

Taxonomy. First record from Réunion and the Mascarenes by FRICKE (1999: 161), based on SMNS material.

Distribution. Réunion, Rodrigues. Marine species. Found in coral reefs including reef flats in coral-rich areas, in areas of mixed sand and rubble, at depths of 0–18 m. Outside the area, East Africa east to Marshall Islands and Tonga, north to Ryukyu Islands, south to Queensland/Australia and New Caledonia.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Very sensitive to human activities. Probable decline. Medium priority for conservation action.

*Scorpaenodes parvipinnis* (Garrett, 1864) – Coral scorpionfish

Taxonomy. First record from Réunion by CHABANET (1994: 238); record confirmed by FRICKE (1999: 161), based on SMNS material.

Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Found in areas of rich coral growth from near shore to the outer reef slope, including tidal pools, at depths of 0–49 m. Outside the area, Red Sea, East and South Africa east to Hawaiian and Marquesas islands, north to Taiwan, south to Western Australia, Lord Howe Island, and Tonga.

Conservation. Vulnerable in Réunion (VU). Threats: HAB, EUT. Rare. Very sensitive to human activities. Significant decline. High priority for conservation action.

*Scorpaenopsis diabolus* Cuvier, 1829 – Devil scorpionfish, false scorpionfish

Taxonomy. First record from Réunion by LETOURNEUR (1992: unpag. 2); record confirmed by FRICKE (1999: 161–162), based on LEMUR and MHNRUN material.

Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles. Marine species. Benthic on rubble or weedy coralline-rock bottoms of reef flats and lagoon and seaward reefs, at depths of 1–70 m. Outside the area, Red Sea and East Africa east to Hawaiian and Marquesas islands, north to South Korea and southern Japan, south to North West Cape/Western Australia, Elizabeth and Middleton reefs, New Caledonia and Tonga.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Scorpaenopsis gibbosa* (Bloch & Schneider, 1801) – Humpback scorpionfish

Taxonomy. First record from Réunion by BLEEKER (1874: 87) as *Scorpaenopsis gibbosus*; previously listed by GUICHENOT (1863: C24) as *Scorpaena Mesogallica*; record confirmed by FRICKE (1999: 162), based on LEMUR, MHNRUN, SAIAB and SMNS material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Farquhar Islands, Seychelles. Marine species. Found benthic, camouflaged among rocks and corals, including tidal pools, at depths of 0–5 m. Outside the area, East Africa east to Chagos Archipelago.

Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Scorpaenopsis longispina* Randall & Eschmeyer, 2001 – Western raggy scorpionfish

Taxonomy. Original description in part from Réunion by RANDALL & ESCHMEYER (2001: 29–33); previously listed as *S. venosa* (non Cuvier [ex Russell], 1829) by LETOURNEUR (1992:

40, 99, unpag. 2), and FRICKE (1999: 162–163), based on MHNRUN material.
Distribution. Réunion, Rodrigues. Marine species. Found in coral reefs, at depths of 0–50 m. Outside the area, Red Sea, East and South Africa east to Indonesia, Philippines and Samoa, north to southern Japan, south to Dampier Archipelago/Western Australia, Queensland/Australia and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Very sensitive to human activities. Probable decline. Medium priority for conservation action.

*Sebastapistes mauritiana* (Cuvier in Cuvier & Valenciennes, 1829) – Mauritius scorpionfish, spineblotch scorpionfish; Rascasse de Suez
Taxonomy. First record from Réunion by GUICHENOT (1863: C25); subsequently described as *Scorpaena megastoma* by SAUVAGE (1878: 127, pl. 1, fig. 7), and listed by HARMELIN-VIVIEN (1976: 91) as *Sebastapistes nuchalis* (non Günther, 1874); record confirmed by FRICKE (1999: 163–164), based on MNHN and SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Marine species. Benthic on rocky and coral reefs, on reef flats and shallow lagoon reefs exposed to wave action, including tidal pools, at depths of 0–120 m. Outside the area, Red Sea and East Africa east to Wake Atoll, Marshall Islands and Pitcairn Group, south to New Caledonia and Rapa; immigrated into eastern Mediterranean Sea through the Suez Canal.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Sebastapistes tinkhami* (Fowler, 1946) – Dark-spotted scorpionfish
Taxonomy. First record from Réunion and the Mascarenes by FRICKE (1999: 164), based on BPBM and SMNS material.
Distribution. Réunion, Mauritius. Marine species. Found in coral reef habitats, at depths of 0–10 m. Outside the area, South Africa, East Coral Sea, Loyalty Islands, Rotuma, Fiji and Wake Atoll east to Pitcairn Group, north to Ryukyu and Ogasawara islands.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Very sensitive to human activities. Probable decline. Medium priority for conservation action.

*Taenianotus triacanthus* Lacepède, 1802 – Leaf scorpionfish; Rascasse
Taxonomy. First record from Réunion by LETOURNEUR (1992: 40 as *Taenionothus triacanthus*; record confirmed by FRICKE (1999: 164–165), based on LEMUR and MHNRUN material.
Distribution. Réunion, Mauritius, Madagascar, Agalega Islands, Seychelles. Marine species. Benthic in coral and rocky reefs, on reef flats, outer reef slopes, current-swept channels, and rarely on lagoon reefs, at depths of 0–134 m. Outside the area, East Africa east to Galapagos Archipelago, north to southern Japan, south to Western Australia at 14°04'S, New South Wales/Australia, New Caledonia and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

### Tetrarogidae – Waspfishes

Remarks. *Neocentropogon* sp. was recorded from Réunion by DURVILLE et al. (submitted), based on MHNRUN material; the species will be described by J.-C. QUÉRO.

*Ablabys taenianotus* (Cuvier [ex Commerson], 1829) – Cockatoo waspfish
Taxonomy. First record from Réunion by FRICKE (1999: 165–166); previously listed by LETOURNEUR (1992: 53) as *A. binotatus* (non Peters, 1855).
Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Found in areas with sand, rubble and weed adjacent to coral reefs, at depths of 0–78 m. Outside the area, eastern Indonesia east to Philippines and Fiji, north to Taiwan, south to Kimberleys/Western Australia, Lord Howe and Norfolk islands.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

### Synanceiidae – Stonefishes

*Synanceia verrucosa* Bloch & Schneider, 1801 – Reef stonefish; Crapaud (Réunion), poisson-pierre commun (France)
Taxonomy. First record from Réunion by BLEEKER (1874: 87); previously listed by GUICHENOT (1863: C25) as *S. brachio* and *S. horrida* (non Linné, 1766); record confirmed by FRICKE (1999: 166–167), based on MHNRUN and MNHN material.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Cargados Carajos, Seychelles. Transitional water and marine. Found on coral or rubble areas adjacent to coral or rocky reefs including lagoon habitats, tidal pools and estuaries; secretive, at depths of 0–30 m. Outside the area, Red Sea and East Africa east to Marshall, Tuamotu and Gambier islands, north to southern Japan, south to Shark Bay/Western Australia, Queensland/Australia at 23°30'S, Middleton Reef, New Caledonia, Tonga and Austral Islands.
Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

### Triglidae – Gurnards

*Pterygotrigla guezei* Fourmanoir in Fourmanoir & Guézé, 1963 – Mauritius gurnard; Grondin mauricien
Taxonomy. Original description from Réunion by FOURMANOIR in FOURMANOIR & GUÉZÉ (1963: 18, fig. 4).
Distribution. Réunion, Mauritius. Marine species. Demersal, on soft bottoms. Endemic to western Mascarenes.
Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Rare. Local importance. Sensitive to human activities. Decline unknown. Low priority for conservation action.

### Peristediidae – Armoured searobins

*Paraheminodus murrayi* (Günther, 1880) – Murray's armoured gurnard
Taxonomy. First record from Réunion by DURVILLE et al. (submitted), based on MHNRUN material.
Distribution. Réunion. Marine species. Bathydemersal, at depths of 360–710 m. Outside the area, South Africa, Banda Sea north to southern Japan, south to New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: FIB,

EUT. Rare. Local importance. Sensitive to human activities. Decline unknown. Low priority for conservation action.

*Satyrichthys investigatoris* (Alcock, 1898) – Investigator armoured gurnard
Taxonomy. First record from Réunion by Durville et al. (submitted), based on MHNRUN material.
Distribution. Réunion. Marine species. Bathydemersal, at depths of 550–658 m. Outside the area, East and South Africa east to India.
Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Rare. Local importance. Sensitive to human activities. Decline unknown. Low priority for conservation action.

## Platycephalidae – Flatheads

?*Cociella crocodila* (Tilesius, 1812) – Crocodile flathead; Platycéphale crocodile
Taxonomy. First record from Réunion by Fourmanoir & Guézé (1963: 11) as *Platycephalus crocodilus*. The record of this species needs verification according to Knapp (1996); it may have been based on *Kumococius rodericensis*.
Distribution. Réunion, Mauritius, Madagascar. Transitional water and marine. Found on sand or mud bottoms including estuaries, at depths of 0–100 m. Outside the area, Red Sea, East and South Africa east to Solomon Islands, north to southern Japan, south to New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Kumococius rodericensis* (Cuvier in Cuvier & Valenciennes, 1829) – Spiny flathead; Platycéphale cocarde
Taxonomy. Original description in part from Réunion by Cuvier in Cuvier & Valenciennes (1829b: 253) as *Platycephalus crocodilus*; subsequently listed by Playfair & Günther (1867: X) as *P. scaber* (non Linnaeus, 1758).
Distribution. Réunion, Mauritius. Marine species. Demersal on sand and mud bottoms, at depths of 6–75 m. Outside the area, Gulf of Oman east to Philippines, north to southern Japan, south to northern Australia.
Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.
Remarks. Though this species was originally described from Rodrigues, Heemstra et al. (2004) did not observe it there; they concluded that the type locality was probably erroneous.

*Sunagocia otaitensis* Cuvier [ex Parkinson] in Cuvier & Valenciennes, 1829 – Fringelip flathead
Taxonomy. First record from Réunion by Letourneur (1992: unpag. 2) as *Thysanophrys otaitensis*; record confirmed by Fricke (1999: 171) as *T. otaitensis*, based on LEMUR material. Taxonomic decision of Knapp & Imamura (2004: 545).
Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Burying in sand and rubble areas of lagoon and seaward coral reefs, at depths of 0–40 m. Outside the area, East and South Africa east to Marshall Islands and Pitcairn Group, north to Izu and Ogasawara islands, south to North West Cape/Western Australia, New Caledonia and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Thysanophrys chiltonae* Schultz in Schultz, Woods & Lachner, 1966 – Longsnout flathead; Platycéphale clin d'œil
Taxonomy. First record from Réunion by Knapp (1984: 2 unnumbered pp.).
Distribution. Réunion, Mauritius, Rodrigues, Comores, Seychelles. Marine species. Found on sand bottoms adjacent to coral reefs, at depths of 1–80 m. Outside the area, Red Sea and East Africa east to Mariana, Marshall and Marquesas islands, north to Ryukyu Islands, south to North West Cape/Western Australia, New Caledonia and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

## Ambassidae – Glassies

*Ambassis ambassis* (Lacepède [ex Commerson], 1802) – Commerson's glassy
Taxonomy. Original description from Réunion by Lacepède (1802: 252, 273–276) as *Centropomus ambassis*; subsequently described as *Ambassis Commersonii* by Cuvier in Cuvier & Valenciennes (1828: 176–181, pl. 25; in part).
Distribution. Réunion, Mauritius, Seychelles. Freshwater, transitional water and marine. Found in lower reaches of streams, estuaries, and in adjacent marine areas. Endemic to islands in the southwestern Indian Ocean.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT, CON. Local importance. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Ambassis natalensis* (Gilchrist & Thompson, 1908) – Natal glassy; Ambache, ambache du large (Réunion), ambasse (France)
Taxonomy. **New record** from Réunion; previously described by Maugé (1984a: 211–218 as *Ambassis gymnocephalus*); record confirmed as *Ambassis gymnocephalus* by Fricke (1999: 172–173), based on MHNRUN and MNHN material. Anderson & Heemstra (2003: 200–201, 205–206) concluded that *Ambassis gymnocephalus* is a nomen dubium; they classified the second Mascarene species as *A. dussumieri*.
Distribution. Réunion, Mauritius, Madagascar, Seychelles. Freshwater, transitional water and marine. Found in lower reaches of streams, estuaries, and in adjacent marine areas. Outside the area, South and East Africa east to Philippines, north to China and Taiwan, south to northern Australia.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT, CON. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

## Acropomatidae – Splitfin perches

*Synagrops japonicus* (Döderlein in Steindachner & Döderlein, 1883) – Japanese splitfin
Taxonomy. First record from Réunion by Blanc & Postel (1958: 368, 370, 373); record confirmed by Fricke (1999: 173), based on MNHN material.
Distribution. Réunion, Madagascar. Marine species. Bathydemersal on continental slope, at depths of 100–800 m. Outside the area, East Africa east to Hawaiian and Gilbert islands, north to southern Japan, south to Western Australia and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitivity to human activities unknown. Decline unknown. Low priority for conservation action.

Symphysanodontidae – Slopefishes

Remarks. *Symphysanodon* sp. was recorded from Réunion by DURVILLE et al. (submitted); the species will be described by J.-C. QUÉRO.

Serranidae – Groupers

*Aethaloperca rogaa* (Forsskål in Niebuhr, 1775) – Redmouth grouper; Vieille roga

Taxonomy. First record from Réunion by HARMELIN-VIVIEN (1976: 91).

Distribution. Réunion, Comores, Madagascar. Transitional water and marine. Found in coastal reefs and lagoons, often silty habitats, in or near caves and holes in the reef, including estuaries; at depths of 1–60 m. Outside the area, Red Sea, East and South Africa east to Marshall Islands and Fiji, north to southern Japan, south to northwestern Australia, Queensland/Australia and New Caledonia.

Conservation. Extinct in Réunion (RE), see LETOURNEUR et al. (2004: 210). Threats: FIT, HAB, EUT. Very sensitive to human activities. Keystone species. High priority for conservation action. A reintroduction might be considered.

*Anyperodon leucogrammicus* (Cuvier [ex Reinwardt] in Cuvier & Valenciennes, 1828) – Slender grouper, slender rockcod; Mérou élégant

Taxonomy. First record from Réunion by HEEMSTRA & RANDALL (1984: 2 unnumbered pp.).

Distribution. Réunion, Mauritius, Rodrigues, Seychelles. Marine species. Found in coral-rich areas and clear waters on lagoon and seaward reefs, at depths of 1–80 m. Outside the area, Red Sea and East Africa east to Marshall Islands and Tonga, north to southern Japan, south to Western Australia, Queensland/Australia and New Caledonia.

Conservation. Endangered in Réunion (EN). Threats: FIT, HAB, EUT. Rare. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Aulacocephalus temminckii* Bleeker, 1854 – Golden-ribbon soapfish; Savon à bande jaune (Réunion)

Taxonomy. First record from Réunion by POSTEL et al. (1964: 346–347) as *Aulacocephalus temmincki*; previously described as *Centropristis saponaceus* by VALENCIENNES (1862: 1167–1168); record confirmed by FRICKE (1999: 210–211), based on MHNRUN, MNHN and NMW material.

Distribution. Réunion, Mauritius, Comores. Marine species. Found in caves and crevices of rocky reefs, at depths of 20–120 m. Outside the area, antiequatorial distribution from Red Sea and South Africa east to Rapa, north to Japan and Ogasawara Islands, south to New Zealand and Kermadec Islands.

Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Cephalopholis argus* Bloch & Schneider, 1801 – Peacock grouper, peacock rockcod; La prude (Réunion), mérou céleste (France)

Taxonomy. First record from Réunion by BLEEKER (1874: 89) as *Epinephelus argus*; previously listed by GUICHENOT (1863: C23) as *Serranus myriaster*; record of *Cephalopholis argus* confirmed by FRICKE (1999: 175–176), based on LEMUR, MHNRUN, MNHN and NMW material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Marine species. Found on coral and rocky reefs including tidal pools, at depths of 1–40 m. Outside the area, Red Sea, East and South Africa east to Wake Atoll, northern Line Islands and Pitcairn Group, north to southern Japan, south to Western Australia, Lord Howe Island, Tonga and Rapa, recently introduced to Hawaiian Islands.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Cephalopholis aurantia* (Valenciennes in Cuvier & Valenciennes, 1828) – Golden hind; Rouge batard (Réunion, young specimens), rouge peau dure (Réunion, adult specimens), vieille dorée (France)

Taxonomy. First record from Réunion by BLEEKER (1874: 88) as *Epinephelus aurantius*; previously listed by GUICHENOT (1863: C23) as *Serranus analis*; record of *Cephalopholis aurantia* confirmed by FRICKE (1999: 176), based on BPBM, MHNRUN, MNHN and NMW material.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Marine species. Demersal on deeper, steep seaward coral reefs, at depths of 20–250 m, usually below 100 m. Outside the area, South Africa east to Marshall Islands and Pitcairn Group, north to Ryukyu Islands, south to Western Australia, Queensland/Australia, New Caledonia and Rapa.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Cephalopholis boenak* (Bloch, 1790) – Chocolate hind; Vieille chocolat

Taxonomy. First record from Réunion by HEEMSTRA & RANDALL (1984: 2 unnumbered pp.) as *Epinephelus boenack*; record of *Cephalopholis boenak* confirmed by FRICKE (1999: 176–177), based on MHNRUN material.

Distribution. Réunion, Mauritius, Comores, Madagascar, Aldabra. Transitional water and marine. Found in coral and rocky reefs, at depths of 1–64 m. Outside the area, East Africa east to Philippines and Solomon Islands, north to Shanghai/China, south to Western Australia, Queensland/Australia and New Caledonia.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Cephalopholis leopardus* (Lacepède [ex Commerson], 1801) – Leopard hind, leopard rockcod; Vieille léopard

Taxonomy. First record from Réunion by HEEMSTRA & RANDALL (1984: 2 unnumbered pp); record confirmed by LETOURNEUR et al. (2004: 204), based on underwater photographs and an aquarium specimen.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Marine species. Found in coral-rich areas of lagoon pinnacles, channels, and outer slopes of coral reefs, at depths of 1–40 m. Outside the area, East Africa east to Northern Marianas, Line and Marquesas islands, north to Ryukyu Islands, south to Western Australia, Queensland/Australia at 15°50'S, New Caledonia and Tonga.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Cephalopholis miniata* (Forsskål in Niebuhr, 1775) – Coral hind, coral rockcod; Ananas batard (Réunion), vieille étoilée (France)

Taxonomy. First record from Réunion by HEEMSTRA & RANDALL (1984: 2 unnumbered pp).

Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles. Marine species. Demersal on various coral reef habitats, at depths of 2–150 m. Outside the area, Red Sea and East Africa east to Fiji and Tonga, north to Ogasawara Islands, south to Western Australia, Queensland/Australia and New Caledonia.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Rare. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Cephalopholis polleni* (Bleeker, 1868) – Harlequin hind, harlequin rockcod; Cabot guignan (Réunion), vieille arlequin (France)

Taxonomy. Originally described from Réunion by Bleeker (1868a: 336–339) as *Epinephelus Polleni*; subsequently listed by Guichenot (1863: C23) as *Serranus formosus* (non Shaw, 1804).

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar. Marine species. Demersal on deeper coral reefs on the edge of steep drop-offs, rarely in less than 30 m depth, down to at least 120 m. Outside the area, east to Line Islands, north to Guam.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Cephalopholis sexmaculata* (Rüppell, 1830) – Sixspot hind, sixblotch rockcod; Rouge l'allié (Réunion), vieille six taches (France)

Taxonomy. First record from Réunion by Heemstra & Randall (1993: 55–56); previously listed by Postel et al. (1964: 356) as *Cephalopholis gibbus*, and by Letourneur (1992: 53) as *Cephalopholis leopardus* (non Lacepède [ex Commerson], 1802); record confirmed by Fricke (1999: 179–180), based on MHNRUN material.

Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles. Marine species. Found in coral reefs, usually along deep walls with caves, rich with invertebrate growth such as large sponges or soft corals, at depths of 6–150 m. Outside the area, Red Sea, East and South Africa east to Line, Marquesas and Society islands, north to southern Japan, south to Great Barrier Reef at 23°30'S and Lord Howe Island.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Cephalopholis sonnerati* (Valenciennes in Cuvier & Valenciennes, 1828) – Tomato hind, tomato rockcod; Rouge ananas, la prude rouge (Réunion), vieille ananas (France)

Taxonomy. First record from Réunion by Postel et al. (1964: 355) as *C. sonnerati* and *C. cyanostigma* (non Cuvier [ex Kuhl & Hasselt] in Cuvier & Valenciennes, 1828); previously described as *Epinephelus unicolor* by Liénard in Bleeker (1874: 89; syntype: NHMI 422 from Mauritius); record confirmed by Fricke (1999: 160–161), based on MHNRUN and NMW material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Marine species. Found on steep outer slopes of coral reefs; also on rocky reefs; juveniles are usually found near sponges or coral heads; at depths of 10–150 m. Outside the area, Gulf of Aden, Gulf of Oman, East and South Africa east to Marshall Islands, Samoa and Tonga, north to southern Japan, south to Western Australia at 24°24'S and New Caledonia.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Cephalopholis spiloparaea* (Valenciennes in Cuvier & Valenciennes, 1828) – Tomato grouper; Vieille fraise

Taxonomy. First record from Réunion by Eichler & Myers (1997: 96).

Distribution. Réunion, Mauritius, Comores. Marine species. Found in coral reefs, at depths of 15–108 m. Outside the area, East Africa east to Pitcairn Group, north to Taiwan, Ogasawara and Wake islands, south to Western Australia, New Caledonia and Rapa.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Cephalopholis urodeta* (Bloch & Schneider [ex Forster], 1801) – Darkfin hind, dusky rockcod; Cuisinier (Réunion), vieille chinois foncée (France)

Taxonomy. First record from Réunion by Bleeker (1874: 89) as *Epinephelus urodelus*; previously described as *Serranus erythraeus* by Valenciennes in Cuvier & Valenciennes (1830b: 516), and listed by Sauvage (1891: 55–57) as *Epinephelus nigripinnis*; record confirmed by Fricke (1999: 181–183), based on MNHN, NMW and SMNS material.

Distribution. Réunion, Mauritius, Soudan Bank, Rodrigues, Madagascar, Seychelles. Marine species. Found in coral reefs including lagoon habitats, at depths of 1–60 m. Outside the area, East Africa east to Wake Atoll, Line Islands and Pitcairn Group, south to Western Australia at 32°01'S, Queensland/Australia at 18°16'S, New Caledonia, Tonga and Rapa.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Epinephelus chlorostigma* (Valenciennes in Cuvier & Valenciennes, 1828) – Brown-spotted rockcod; Loche pintade

Taxonomy. First record from Réunion by Postel et al. (1964: 377–379); record confirmed by Fricke (1999: 181–183), based on MHNRUN material.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles, Cargados Carajos. Transitional water and marine. Found in coral and rocky reefs and associated lagoon habitats, at depths of 4–300 m. Outside the area, Red Sea, East and South Africa east to Marshall, Tongan and Line islands, north to southern Japan, south to Western Australia and New Caledonia.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Epinephelus coeruleopunctatus* (Bloch, 1790) – White-spotted grouper; Loche à taches blanches

Taxonomy. First record from Réunion by Heemstra & Randall (1984: 2 unnumbered pp.) as *Epinephelus caeruleopunctatus*.

Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Found in coral reefs on coral or rock bottom, including tidal pools, at depths of 0–65 m. Outside the area, East Africa east to Marshall Islands, Fiji and Tonga, north to southern Japan, south to Western Australia, northern New South Wales/Australia and New Caledonia.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Rare. Sensitive to human activities. Keystone species. Severe decline. High priority for conservation action.

*Epinephelus coioides* (Hamilton, 1822) – Orange-spotted grouper; Mérou à taches oranges

Taxonomy. First record from Réunion by RANDALL & HEEMSTRA (1991: 122–125); record confirmed by FRICKE (1999: 184), based on MHNRUN material.

Distribution. Réunion, Mauritius. Transitional water and marine. Found on various substrates, from estuaries down to 100 m depth. Outside the area, Red Sea and East Africa east to Fiji, north to Ryukyu Islands, south to Western Australia, New South Wales/Australia and New Caledonia.

Conservation. Endangered in Réunion (EN). Threats: FIT, HAB, EUT. Very sensitive to human activities. Keystone species. Severe decline. High priority for conservation action.

*Epinephelus flavocaeruleus* (Lacepède [ex Commerson], 1802) – Blue-and-yellow grouper; Le plat, platte ailes jaunes (Réunion), mérou faraud (France)

Taxonomy. First record from Réunion by BLEEKER (1874: 88); previously described by QUOY & GAIMARD (1824: 312–313) as *Serranus borbonicus*; record confirmed by FRICKE (1999: 186–187), based on MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Found on coral and rocky reefs, from shallow water (juveniles) down to 150 m depth. Outside the area, Persian/Arabian Gulf, Gulf of Aden, East and South Africa east to Andaman Islands, western Thailand and Sumatera/Indonesia.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Epinephelus fuscoguttatus* (Forsskål in Niebuhr, 1775) – Brown-marbled grouper, blotchy rockcod; Mérou marbré

Taxonomy. First record from Réunion by HEEMSTRA & RANDALL (1984: 2 unnumbered pp.); record confirmed by FRICKE (1999: 188), based on MHNRUN material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Marine species. Found on coral reefs (juveniles in seagrass beds), from shallow water down to 60 m depth. Outside the area, East Africa east to Samoa, north to Ryukyu Islands, south to Western Australia, New South Wales/Australia, New Caledonia and Tonga.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Epinephelus hexagonatus* (Bloch & Schneider [ex Forster], 1801) – Star-spotted grouper; Maccabit, maccabit gris, risadel (Réunion), mérou mélifère (France)

Taxonomy. First record from Réunion by GUICHENOT (1863: C23) as *Serranus hexagonatus*; subsequently listed by BLEEKER (1874: 89: part) as *Epinephelus merra* (non Bloch, 1793), and on p. 90 as *E. stellans*; record confirmed by FRICKE (1999: 188–190), based on LEMUR, MHNRUN, MNHN, RMNH and SMNS material.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Aldabra. Marine species. Found in shallow parts of rocky and coral reefs including lagoons and tidal pools, at depths of 0–30 m. Outside the area, Red Sea and East Africa east to Wake Atoll, northern Line Islands and Pitcairn Group, south to Western Australia, Queensland/Australia at 23°30'S, New Caledonia and Rapa.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Epinephelus lanceolatus* (Bloch, 1790) – Giant grouper, brindle-bass; Mérou lancéolé

Taxonomy. First record from Réunion by HEEMSTRA & RANDALL (1984: 2 unnumbered pp.).

Distribution. Réunion, Mauritius, Madagascar. Transitional water and marine. Found in shallow coral reefs and adjacent estuaries down to 100 m depth. Outside the area, Red Sea, East and South Africa east to Hawaiian Islands and Pitcairn Group, north to southern Japan, south to Western Australia, New South Wales/Australia, northern New Zealand and Tonga.

Conservation. Endangered in Réunion (EN). Threats: FIT, HAB, EUT. Rare. Very sensitive to human activities. Keystone species. Severe decline. High priority for conservation action.

*Epinephelus longispinis* (Kner, 1864) – Longspine grouper, streaky rockcod; Coulotte de singe, cabot sale (Réunion), mérou à longues épines (France)

Taxonomy. First record from Réunion by HEEMSTRA & RANDALL (1984: 2 unnumbered pp.); previously reported by POSTEL et al. (1964: 370–371) as *Epinephelus fario* (non Thunberg, 1793); record confirmed by FRICKE (1999: 190–191), based on MNHN material.

Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Found in rocky or coral reefs, on rock and sand, from shallow water to 70 m depth. Outside the area, South and East Africa east to eastern Indonesia, north to Andaman Islands.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Epinephelus macrospilos* (Bleeker, 1858) – Snubnose grouper, bigspot rockcod, bigspot grouper; Maccabit (Réunion), mérou tapis (France)

Taxonomy. First record from Réunion by RANDALL (1987: 148–149); previously recorded by GUICHENOT (1863: C23) as *E. faveatus* (non Valenciennes in Cuvier & Valenciennes, 1828), BLEEKER (1874: 89) as *E. merra* (non Bloch, 1793) and LETOURNEUR (1992: unpag. 2) as *E. faveatus* (non Valenciennes in Cuvier & Valenciennes, 1828); record confirmed by FRICKE (1999: 191), based on MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Marine species. Found in coral or rocky reefs, at depths of 1–44 m. Outside the area, South and East Africa east to Marshall and Marquesas islands, north to southern Japan and Ogasawara Islands, south to Western Australia, Queensland/Australia and New Caledonia.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Epinephelus magniscuttis* Postel, Fourmanoir & Guézé, 1964 – Speckled grouper; Cabot grosse écaille, petit nègre, cabot de fond, cabot aux yeux vert (Réunion), mérou à grandes écailles (France)

Taxonomy. Originally described from Réunion by POSTEL et al. (1964: 365–368) as *E. magniscuttis* and *E. pseudomorrhua*.

Distribution. Réunion, Mauritius. Marine species. Found in deep water in the vicinity of coral reefs, at depths of 50–300 m. Outside the area, South Africa, Philippines and New Guinea east to Fiji and Tonga, south Western Australia and New Caledonia.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Epinephelus malabaricus* (Bloch & Schneider, 1801) – Malabar grouper; Grand gueule (Réunion), mérou malabare (France)

Taxonomy. First record from Réunion by Heemstra & Randall (1984: 2 unnumbered pp.); previously listed by Postel et al. (1964: 369–370) as *E. salmoides*.

Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles. Transitional water and marine. Found in a variety of habitats including estuaries, at depths of 5–150 m. Outside the area, Red Sea and East Africa east to Tonga, north to southern Japan, south to Western Australia, Sydney/New South Wales/Australia and New Caledonia.

Conservation. Endangered in Réunion (EN). Threats: FIT, HAB, EUT. Rare. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Epinephelus melanostigma* Schultz in Schultz, Herald, Lachner, Welander & Woods, 1953 – Oneblotch grouper, oneblotch rockcod; Mérou dossard

Taxonomy. First record from Réunion by Letourneur (1992: unpag. 2).

Distribution. Réunion, Mauritius, Madagascar. Marine species. Found in shallow coral reefs and lagoons, at depths of 0–7 m. Outside the area, East Africa east to Line and Cook islands, north to Taiwan, south to Western Australia.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Rare. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Epinephelus merra* Bloch, 1793 – Honeycomb grouper, dwarf spotted grouper; Maccabit, maccabit blanc (Réunion), griffin (Réunion, young specimens), plat gris (Réunion, adult specimens), mérou gateau de cire (France)

Taxonomy. First record from Réunion by Bleeker (1874: 89, part); record confirmed by Fricke (1999: 193–194), based on LEMUR, MHNRUN, MNHN and SMNS material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Found in shallow protected and seaward coral reefs and lagoons, including tidal pools, at depths of 0–50 m. Outside the area, East Africa east to Wake Atoll and Pitcairn Group, north to southern Japan, south to Western Australia at 22°05'S, New South Wales/Australia at 33°59'S, Lord Howe Island, Tonga and Rapa.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Epinephelus morrhua* (Valenciennes in Cuvier & Valenciennes, 1833) – Comet grouper, contour rockcod; Cabot noir, cabot de fond (Réunion), mérou comète (France)

Taxonomy. First record from Réunion by Guichenot (1863: C23) as *Serranus morrhua*; record confirmed by Fricke (1999: 195), based on MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar. Marine species. Found on deep reefs at 80–370 m depth. Outside the area, Red Sea and East Africa east to Cook Islands, south to Western Australia, New South Wales/Australia at 28°35'S, New Caledonia and Tonga.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Epinephelus multinotatus* (Peters, 1876) – White-blotched grouper; Plat nègre, cabot nègre (Réunion), mérou plate grise (France)

Taxonomy. First record from Réunion by Heemstra & Randall in Smith & Heemstra (1986: 529); previously listed by Guichenot (1863: C23) as *Serranus dermochirus* (non Valenciennes in Cuvier & Valenciennes, 1830), and by Postel et al. (1964: 371–372) as *Epinephelus leprosus*; record confirmed by Fricke (1999: 195–196), based on MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Found from shallow rocky and coral reef areas (juveniles) to depth of 123 m (adults). Outside the area, East Africa east to Northern Territory/Australia, north to southern Japan, south to Shark Bay/Western Australia.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Epinephelus oceanicus* (Lacepède, 1802) – Indian Ocean blacktip grouper; Rougette (Réunion), mérou oriflamine (France)

Taxonomy. **New record** from Réunion, based on MHNRUN and MNHN material [as listed by Fricke (1999: 184) for *Epinephelus fasciatus* (non Forsskål in Niebuhr, 1775)]; previously listed by Guichenot (1863: C23) as *Serranus marginalis* (non Bloch, 1793), and by Bleeker (1874: 88, 90) as *Epinephelus fasciatus* (non Forsskål in Niebuhr, 1775) and *E. tsirimenara* (non Temminck & Schlegel, 1842). Taxonomic decision of the present paper, following Gill & Kemp (2002: 165) who believe that the allegedly widespread species that was previously named *Epinephelus fasciatus* is made up of six different geographically isolated species. *Holocentrus oceanicus* of Lacepède (1802: 345, 389) is the oldest available name for western Indian Ocean populations.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles, Cargados Carajos. Transitional water and marine. Found on coral reefs and rock bottoms, at depths of 1–160 m. Outside the area, East and South Africa east to Sri Lanka.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Epinephelus octofasciatus* Griffin, 1926 – Eightbar grouper; Plat, cabot sale, rouge sale, cabot cafre (Réunion), mérou à huit raies (France)

Taxonomy. First record from Réunion by Randall & Heemstra (1991: 217–219); listed by Blanc & Postel (1958: 368, 370, 373) as *E. grammatophorus* (non Boulenger, 1903), and by Biais & Taquet (1992: 74) as *E. septemfasciatus* (non Thunberg, 1793); described by Postel et al. (1964: 364–365) as *E. compressus*; record confirmed by Fricke (1999: 196–197), based on MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Comores, Madagascar. Marine species. Found on deep reefs, at depths of 150–300 m. Outside the area, Persian Gulf, Gulf of Aden and South Africa east to Marquesas Islands, north to Ogasawara Islands, south to Rottnest Island/Western Australia, northern New Zealand, Kermadec Islands, and Tonga.

Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Epinephelus poecilonotus* (Temminck & Schlegel, 1842) – Dot-dash grouper, dot-dash rockcod; Mérou morse
Taxonomy. First record from Réunion by HEEMSTRA & RANDALL (1984: 2 unnumbered pp.); record needs verification.
Distribution. Réunion, Mauritius, Comores, Madagascar. Marine species. Found on deep reefs, at depths of 45–375 m. Outside the area, South and East Africa east to Fiji, north to central Japan and Ogasawara Islands.
Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Sensitive to human activities. Keystone species. Decline unknown. Low priority for conservation action.

*Epinephelus radiatus* (Day, 1868) – Oblique-banded grouper; Mérou zébré
Taxonomy. First record from Réunion by HEEMSTRA & RANDALL (1984: 2 unnumbered pp.); record confirmed by FRICKE (1999: 197), based on MNHN material.
Distribution. Réunion, Mauritius, Comores. Marine species. Found on deep reefs, at depths of 18–383 m (adults below 80 m). Outside the area, Red Sea and East Africa east to New Britain/Papua New Guinea, north to southern Japan, south to Rowley Shoals/Western Australia.
Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Epinephelus retouti* Bleeker, 1868 – Red-tipped grouper, red-tipped rockcod; Rouge du large, rouge noir (Réunion), mérou rouge (France)
Taxonomy. Originally described from Réunion by BLEEKER (1868a: 339–341).
Distribution. Réunion, Mauritius, Rodrigues. Marine species. Found on deep rocky and coral reefs, at depths of 18–383 m (adults below 80 m). Outside the area, Madagascar east to Marshall, Line and Society islands, north to southern Japan, south to New Caledonia and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Epinephelus rivulatus* (Valenciennes in Cuvier & Valenciennes, 1830) – Halfmoon grouper, halfmoon rockcod; Cabot sale, rouge sale (Réunion), mérou demi-lune (France)
Taxonomy. Originally described from Réunion by VALENCIENNES in CUVIER & VALENCIENNES (1830b: 515) as *Serranus rivulatus*.
Distribution. Réunion, Mauritius, Madagascar. Transitional water and marine. Found on coral reefs, rocks, algae and seagrass beds, at depths of 1–150 m. Outside the area, East Africa east to Tonga, north to Ogasawara Islands, south to Western Australia at 32°01'S and northern New Zealand.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Rare. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Epinephelus spilotoceps* Schultz in Schultz, Herald, Lachner, Welander & Woods, 1953 – Foursaddle grouper, foursaddle rockcod; Mérou à quatre selles
Taxonomy. First record from Réunion by HEEMSTRA & RANDALL (1984: 2 unnumbered pp.); record confirmed by FRICKE (1999: 199), based on SMNS material.
Distribution. Réunion, Mauritius, Madagascar, Aldabra. Marine species. Found in rocky and coral reefs, at depths of 0–30 m. Outside the area, East Africa east to Wake, Marshall, Tongan and Cook islands, south to Rowley Shoals/Western Australia and New Caledonia.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Epinephelus tauvina* (Forsskål in Niebuhr, 1775) – Greasy grouper, greasy rockcod; Vieille lutre, vieille nègre (Réunion), mérou loutre (France)
Taxonomy. First record from Réunion by RANDALL & BEN-TUVIA (1983: 413–416); record confirmed by FRICKE (1999: 199–200), based on BPBM, MHNRUN, MNHN, SMNS and USNM material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Found in clear water areas of rocky and coral reefs, juveniles in tidal pools and on the reef flat; adults deeper, at depths of 5–300 m. Outside the area, Red Sea, East and South Africa east to Wake Atoll and Pitcairn Group, north to southern Japan, south to Western Australia, New South Wales/Australia at 29°47'S, Lord Howe Island and Rapa.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Epinephelus tukula* Morgans, 1959 – Potato grouper, potato bass; Mérou patate
Taxonomy. First record from Réunion by FRICKE (1999: 200–201), based on MHNRUN material.
Distribution. Réunion, Mauritius, Comores, Seychelles. Marine species. Adults found in deep coral reef channels at depths of 10–150 m, juveniles in reef tide pools. Outside the area, Red Sea, East and South Africa east to New Guinea, north to southern Japan, south to Townsville/Queensland, Australia.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Gracila albomarginata* (Fowler & Bean, 1930) – Slenderspine grouper; Vieille (Réunion), mérou bord rouge (France)
Taxonomy. First record from Réunion by POSTEL et al. (1964: 356–357) as *Aethaloperca albomarginata*; record confirmed by FRICKE (1999: 201), based on BPBM, MHNRUN and MNHN material.
Distribution. Réunion, Mauritius, Aldabra. Marine species. Found on the outer slope of coral or rocky reefs, at depths of 15–120 m. Outside the area, East Africa east to northern Line and Tuamotu islands, north to Ryukyu Islands, south to New Caledonia and Tonga.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Grammistes sexlineatus* (Thunberg, 1792) – Sixstripe soapfish, skunkfish; Savonette (Réunion), savon rayes d'or (France)
Taxonomy. First record from Réunion by POSTEL et al. (1964: 345–346); previously listed by GUICHENOT (1863: C23) as *G. orientalis*; record of *G. sexlineatus* confirmed by FRICKE (1999: 211–213), based on LEMUR, MHNRUN, MNHN and SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Transitional water and marine. Found in coastal waters over corals and rocks, hiding during the day, at depths of 0.5–130 m. Outside the area, Red Sea, East Africa and East London/South Africa east to Marquesas Islands, north to southern Japan, south to Western Australia, Queensland/Australia, Lord Howe and Kermadec islands, and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: HAB,

EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Liopropoma lunulatum* (Guichenot, 1863) – Yellow perch
Taxonomy. Originally described from Réunion by Guichenot (1863: C4–C5, C24) as *Grystes lunulatus*.
Distribution. Réunion, Mauritius. Marine species. Demersal on deep reefs, at depths of 100–350 m. Outside the area, Red Sea east to Society Islands, north to southern Japan.
Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitivity to human activities unknown. Probable decline. Medium priority for conservation action.

*Liopropoma susumi* (Jordan & Seale, 1906) – Meteor perch
Taxonomy. First record from Réunion by Randall & Taylor (1988: 26–28); record confirmed by Fricke (1999: 203), based on BPBM material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Amirantes, Cargados Carajos. Marine species. Found in coral reef habitats, at depths of 2–34 m. Outside the area, Red Sea and East Africa east to Samoa and Tonga, north to Ryukyu Islands, south to Queensland/Australia at 23°30'S, Middleton Reef and Loyalty Islands.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Meganthias natalensis* (Fowler, 1925) – Gorgeous swallowtail
Taxonomy. First record from Réunion by Fourmanoir & Guézé (1963: 17) as *Holanthias natalensis*; previously described by Pellegrin (1935: 51–53) as *H. furcatus*; record confirmed by Fricke (1999: 202), based on MNHN material. Taxonomic decision of Randall & Heemstra (2006: 29).
Distribution. Réunion, Mauritius, Madagascar. Marine species. Benthopelagic. Outside the area, South Africa.
Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitivity to human activities unknown. Probable decline. Medium priority for conservation action.

*Odontanthias borbonius* (Cuvier in Cuvier & Valenciennes, 1828) – Checked swallowtail
Taxonomy. Originally described from Réunion by Cuvier in Cuvier & Valenciennes (1828: 263–264) as *Serranus Borbonius*; subsequently described by Guichenot (1868: 86) as *Aylopon mauritianus*. Taxonomic decision of Randall & Heemstra (2006: 9).
Distribution. Réunion, Mauritius, Comores, Seychelles. Marine species. Found on deep reef habitats, at depths of 70–300 m. Outside the area, South Africa, Comores and Madagascar east to Guam and New Guinea, north to southern Japan and Ogasawara Islands.
Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitivity to human activities unknown. Probable decline. Medium priority for conservation action.

*Plectropomus laevis* (Lacepède [ex Commerson], 1801) – Black-saddle coral grouper; Mérou selle
Taxonomy. First record from Réunion by Heemstra & Randall (1993: 290–292).
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Found in coral-rich areas of lagoon and seaward reefs, at depths of 4–100 m. Outside the area, East Africa east to Oeno/Pitcairn Group, north to Ryukyu Islands, south to Western Australia, Queensland/Australia at 23°30'S, New Caledonia and Rapa.
Conservation. Extinct in Réunion (RE), according to Letourneur et al. (2004: 210). Threats: FIT, HAB, EUT. Very sensitive to human activities. Keystone species. High priority for conservation action. Reintroduction into suitable habitats might be considered under scientific guidance.

*Pogonoperca ocellata* Günther, 1859 – Snowflake soapfish
Taxonomy. First record from Réunion by Bleeker (1873b: 109–110) as *Grammistes ocellatus*.
Distribution. Réunion, Mauritius, Seychelles. Marine species. Found on deeper coral and rocky reefs. Outside the area, Maldives, western Indonesia.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Pogonoperca punctata* (Valenciennes in Cuvier & Valenciennes, 1830) – Spotted soapfish; Savon (Réunion), savon barbu (France)
Taxonomy. First record from Réunion by Guichenot (1863: C23) as *Grammistes punctatus*; record confirmed by Fricke (1999: 213–214), based on MHNRUN and MNHN material.
Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles. Marine species. Found on coral reefs, usually associated with large coral heads, juveniles in lagoons, adults usually below 20 m down to 216 m depth. Outside the area, Natal/South Africa east to Line, Marquesas and Society islands, north to southern Japan, south to New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Very sensitive to human activities. Probable decline. Medium priority for conservation action.

*Pseudanthias bimaculatus* (Smith, 1955) – Twospot basslet, purple goldie
Taxonomy. First record from Réunion by Fourmanoir & Guézé (1967: 56) as *Anthias bimaculatus*.
Distribution. Réunion. Marine species. Found on deep drop-offs of coral reefs, possibly also on dead reefs, at depths of 10–60 m. Outside the area, East Africa, Maldives and Indonesia.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Pseudanthias cooperi* (Regan, 1902) – Silverstreak goldie, red-bar fairy basslet
Taxonomy. First record from Réunion by Chabanet (1994: 238) as *Anthias cooperi*.
Distribution. Réunion, Mauritius, Seychelles. Marine species. Found on deep drop-offs of coral and rocky reefs, at depths of 10–60 m. Outside the area, East Africa east to Line, Tongan and Samoan islands, north to southern Japan, south to Shark Bay/Western Australia, New South Wales/Australia and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Pseudanthias evansi* (Smith, 1954) – Yellowback anthias, yellowtail goldie
Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 91) as *Anthias evansi*; record confirmed by Fricke (1999: 207), based on BPBM material.
Distribution. Réunion, Mauritius, Rodrigues, Aldabra. Marine species. Found in large schools at upper parts of deep drop-offs of coral and rocky reefs, at depths of 4–40 m. Outside the area, East Africa east to Cocos-Keeling and Christmas islands (eastern Indian Ocean), north to Andaman Sea.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Pseudanthias pulcherrimus* (Heemstra & Randall in Smith & Heemstra, 1986) – Resplendent goldie

Taxonomy. **New record** from Réunion, based on a specimen observed and photographed during a visual census, in Saint-Paul Bay, at 50 m depth, in 2004 (P. Durville, E. Tessier, A. Diringer).

Distribution. Réunion, Mauritius, Seychelles. Marine species. Found on deeper coral reefs, at depths of 30–50 m. Outside the area, east to Maldives and Chagos Archipelago.

Conservation. Vulnerable in Réunion (VU). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Pseudanthias squamipinnis* (Peters, 1855) – Sea goldie

Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 91) as *Anthias squammipinnis*.

Distribution. Réunion, Mauritius, Madagascar, Aldabra. Marine species. Found above coral outcrops or patch reefs of clear lagoons, channels, or outer reef slopes; also on rocky reefs; at depths of 1–50 m. Outside the area, Red Sea and Madagascar east to Society Islands, north to southern Japan, south to Western Australia, Lord Howe Island and Tonga.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Very sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Pseudogramma polyacantha* (Bleeker, 1856) – Honeycomb podge

Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 92) as *Pseudogramma polyacanthum*. The gender of the genus is feminine, therefore the species name must be '*polyacantha*'.

Distribution. Réunion, Rodrigues, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Secretive, lives among corals in lagoons and on reef flats, from tidal pools to 61 m depth. Outside the area, South and East Africa east to northern Line Islands and Pitcairn Group, north to Ryukyu Islands, south to North-West Cape/Western Australia, Lord Howe Island and Tonga.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Very sensitive to human activities. Probable decline. Medium priority for conservation action.

*Variola albimarginata* Baissac, 1953 – Lyretail grouper, white-edged lyretail; Tire bourre (Réunion), croissant queue blanche (France)

Taxonomy. First record from Réunion by Postel et al. (1964: 349); previously recorded by Guichenot (1863: C23) as *Serranus punctulatus* (non Lacepède [ex Commerson], 1801); record confirmed by Fricke (1999: 208–209), based on BPBM material.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Marine species. Found on seaward coral and rocky reefs, at depths of 4–200 m. Outside the area, Outside the area, East Africa east to Marshall Islands, Samoa and Tonga, north to Ryukyu Islands, south to Western Australia, Queensland/Australia and New Caledonia.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Variola louti* (Forsskål in Niebuhr, 1775) – Coronation grouper; Druide, rouge grand queue (Réunion), croissant queue jaune (France)

Taxonomy. First record from Réunion by Bleeker (1874: 89); record confirmed by Fricke (1999: 209–210), based on MHNRUN, MNHN and NMW material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Marine species. Found on offshore clear water coral reefs, at depths of 3–240 m, usually below 15 m. Outside the area, Outside the area, Red Sea, East and South Africa east to Pitcairn Group, north to southern Japan and Ogasawara Islands, south to Western Australia, Lord Howe Island and Rapa.

Conservation. Endangered in Réunion (EN). Threats: FIT, HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

## Pseudochromidae – Dottybacks

*Anisochromis mascarenensis* Gill & Fricke, 2001 – Mascarene annie

Taxonomy. Originally described from Réunion by Gill & Fricke (2001: 197), based on SMNS material; previously recorded by Fricke (1999: 214) as *A. kenyae* (non Smith, 1954).

Distribution. Réunion, Mauritius. Marine species. In coral-rich areas of the fringing reef, associated with *Acropora* corals, at depths of 0–18 m. Endemic to western Mascarenes.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Local importance. Rare. Very sensitive to human activities. Probable decline. Medium priority for conservation action.

*Haliophis guttatus* (Forsskål in Niebuhr, 1775) – African eel-blenny

Taxonomy. First record from Réunion by Playfair & Günther (1867: XIII).

Distribution. Réunion, Mauritius, Comores, Madagascar. Marine species. Found in rock and rubble areas of shallow reefs, at depths of 0–15 m. Outside the area, Red Sea and East Africa.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

## Plesiopidae – Longfins

*Plesiops coeruleolineatus* Rüppell, 1835 – Red-tipped longfin, crimsontip longfin

Taxonomy. First record from Réunion by Letourneur (1992: unpag. 3); previously recorded by Harmelin-Vivien (1976: 92) as *P. melas* (non Smith, 1954); record confirmed by Fricke (1999: 215–216), based on LEMUR, SMNS and USNM material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Found under stones or corals in the lagoon, close to the coral reef, at depths of 0–13 m. Outside the area, Red Sea and East Africa east to Marshall Islands, Samoa and Tonga, north to southern Japan, south to North West Cape/Western Australia, Queensland/Australia at 23°37'S and New Caledonia.

Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

### Terapontidae – Thornfishes

*Terapon jarbua* (Forsskål in Niebuhr, 1775) – Jarbua, crescent-banded grunter, thornfish; Violon jarbua

Taxonomy. First record from Réunion by Bleeker (1874: 89) as *Therapon jarbua*; record confirmed by Fricke (1999: 216–217), based on MNHN material.

Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles. Freshwater, transitional water and marine. Found in lagoons, in the vicinity of river mouths (including tidal pools), entering estuaries, rivers and streams. Outside the area, Red Sea and East Africa east to Palau/Belau, Samoa and Tonga, north to southern Japan, south to Western Australia at 24°53'S, New South Wales/Australia and New Caledonia.

Conservation. Extinct in Réunion (RE), according to Letourneur et al. (2004: 211). Threats: FIT, EUT, CON. Sensitive to human activities. Keystone species. Probable decline. High priority for conservation action.

### Kuhliidae – Flagtails

*Kuhlia caudavittata* (Lacepède [ex Commerson], 1802) – Mascarene flagtail

Taxonomy. First record from Réunion by Blanc & Postel (1958: 368, 373) as *Dules caudavittatus*; record confirmed by Fricke (1999: 217–218), based on MNHN and SMNS material.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar. Freshwater, transitional water and marine. Found in the lower reaches and estuaries of rivers and streams, occasionally also in the adjacent lagoon and in tide pools. Endemic to islands in the southwestern Indian Ocean.

Conservation. Endangered in Réunion (EN). Threats: FIT, EUT, CON. Local importance. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action. Proposed for Annexes II and V of the EU Habitats Directive.

*Kuhlia mugil* (Bloch & Schneider [ex Forster], 1801) – Barred flagtail; Hareng (Réunion), crocro drapeau (France)

Taxonomy. First record from Réunion by Heemstra (1984a: 2 unnumbered pp.); previously listed by Valenciennes (1862: 1168) as *Dules taeniurus*; record confirmed by Fricke (1999: 218–220), based on BPBM, MHNRUN, MNHN, SMNS and USNM material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Freshwater, transitional water and marine. Found in the lower reaches and estuaries of rivers and streams, occasionally also in the adjacent lagoon and in tide pools. Outside the area, Red Sea, East and South Africa east to Panama, north to Taiwan and Minami Tori Shima, south to Western Australia, Lord Howe Island and Rapa, absent from Easter Island, Pitcairn Group, Marquesas and Hawaiian islands.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, EUT, CON. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Kuhlia rupestris* (Lacepède [ex Commerson], 1802) – Rock flagtail; Doule de roche, poisson plat (Réunion), crocro sauvage (France)

Taxonomy. Originally described from Réunion by Lacepède (1802: 252, 273–276) as *Centropomus rupestris*; subsequently described by Cuvier in Cuvier & Valenciennes (1829a: 118–119) as *Dules fuscus*, and listed by Bleeker (1874: 90) as *Moronopsis ciliatus*; record confirmed by Fricke (1999: 220–221), based on MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Freshwater, transitional water and marine. Found in estuaries and fast-flowing stretches of middle and lower reaches of rivers, occasionally also in adjacent lagoons and tide pools. Outside the area, East Africa east to Caroline and Tuamotu islands, north to southern Japan, south to Queensland/Australia and New Caledonia.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, EUT, CON. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

### Priacanthidae – Bigeyes

*Cookeolus japonicus* (Cuvier in Cuvier & Valenciennes, 1829) – Longfinned bullseye; Beauclaire longue aile

Taxonomy. First record from Réunion by Letourneur et al. (2004: 204).

Distribution. Réunion, Comores, Seychelles. Marine species. Demersal on hard bottoms in association with holes and ledges, at depths of 40–400 m. Outside the area, circumglobal in tropical and subtropical oceans.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, FIB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Heteropriacanthus cruentatus* (Lacepède, 1801) – Glasseye; Beau clair du large (Réunion), beau clair de roche (France)

Taxonomy. First record from Réunion by Fourmanoir & Guézé (1962b: 5–6) as *Priacanthus cruentatus* and *P. boops*; previously listed by Guichenot (1863: C24) as *P. japonicus* (non Cuvier in Cuvier & Valenciennes, 1829) and Sauvage (1891: 119–121) as *P. macropus*, and described by Valenciennes (1862: 1168–1169) as *P. alticlarens*; record confirmed by Fricke (1999: 221–222), based on LEMUR, MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles. Marine species. Found in lagoon and seaward coral and rocky reefs, hidden during the day, at depths of 3–300 m. Outside the area, circumglobal in equatorial and tropical areas.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, FIB, HAB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Priacanthus hamrur* (Forsskål in Niebuhr, 1775) – Moontail bullseye; Cardinal, beau clair (Réunion), beau clair miroir (France)

Taxonomy. First record from Réunion by Bleeker (1874: 87); previously listed by Guichenot (1863: C24) as *P. speculum*; record confirmed by Fricke (1999: 222–223), based on MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Marine species. Found on outer slopes of coral and rocky reefs, at depths of 8–150 m. Outside the area, Red Sea, East and South Africa east to Marquesas and Gambier islands, north to southern Japan, south to Western Australia, Queensland/Australia, Lord Howe Island and Tonga.

Conservation. Near threatened in Réunion (NT). Threats: FIT, FIB, HAB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Priacanthus sagittarius* Starnes, 1988 – Arrowfin bigeye; Beauclaire aile sagitté
Taxonomy. Originally described in part from Réunion by STARNES (1988: 178).
Distribution. Réunion. Marine species. Found on deeper slopes of rocky or coral reefs, at depths of 60–100 m. Outside the area, Red Sea east to Philippines and Samoa, north to southern Japan, south to northern Western Australia and New Caledonia.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, FIB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Pristigenys niphonia* (Cuvier in Cuvier & Valenciennes, 1829) – Japanese bigeye; Beau clair du large (Réunion), beau clair bande blanc (France)
Taxonomy. First record from Réunion by GUICHENOT (1863: C24) as *Priacanthus niphonius*; subsequently described as *Myripristis refulgens* by VALENCIENNES (1862: 1169), and listed by SAUVAGE (1891: 131–132) as *Priacanthus meyeri* (non Günther, 1872); record confirmed by FRICKE (1999: 223–224), based on MHNRUN and MNHN material.
Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles. Marine species. Demersal on deeper reef slopes of 80–262 m depth, possibly also shallower. Outside the area, Red Sea, East and South Africa east to eastern Indonesia, Philippines and Samoa, north to southern Japan, south to Western Australia, Queensland/Australia and Loyalty Islands.
Conservation. Near threatened in Réunion (NT). Threats: FIT, FIB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

## Rachycentridae – Cobia

*Rachycentron canadum* (Linné, 1766) – Cobia; Mafou, cobia
Taxonomy. First record from Réunion by LETOURNEUR et al. (2004: 204).
Distribution. Réunion, Mauritius, Madagascar. Marine and transitional waters. Introduced for marine aquaculture; escaped into the natural environment (LETOURNEUR et al. 2004: 204). Also native of the area. Found in a variety of habitats: over mud, sand and gravel bottoms, over coral reefs, off rocky shores and in mangrove sloughs, inshore around pilings and buoys and offshore around drifting and stationary objects, occasionally in estuaries, at depths of 0–1200 m. Outside the area, circumglobal in tropical and subtropical oceans.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, FIB, EUT, AQU. Very sensitive to human activities. Keystone species. Probable decline of the native population. Medium priority for conservation action.

## Apogonidae – Cardinal fishes

*Apogon caudicinctus* Randall & Smith, 1988 – Little tailband cardinalfish
Taxonomy. Originally described in part from Réunion by RANDALL & SMITH (1988: 2).
Distribution. Réunion. Marine species. Found in shallow water in rocky or coral reefs, at depths of 0–12 m, hiding during the day. Outside the area, Mauritius east to Pitcairn Group, north to Ryukyu and Ogasawara islands, south to New Caledonia, Tonga and Rapa.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Apogon indicus* Greenfield, 2001 – Indian Ocean cardinalfish
Taxonomy. **New record** from Réunion, based on *A. coccineus* (non Rüppell, 1838) of FRICKE (1999, 226), LEMUR material.
Distribution. Réunion, Mauritius, Comores. Marine species. Found in shallow water in rocky or coral reefs, at depths of 0–24 m, hiding during the day. Outside the area, east to Palau/Belau and southern Line Islands, north to Philippines, south to New Caledonia and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Apogon semiornatus* Peters, 1877 – Oblique-banded cardinalfish, threeband cardinalfish
Taxonomy. First record from Réunion by FRICKE (1999: 230), based on SMNS material.
Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles. Marine species. Found in shallow water in rocky or rubble reefs, at depths of 0–10 m, hiding during the day. Outside the area, Red Sea, East and South Africa east to Philippines, Solomon Islands and Tonga, north to southern Japan, south to Western Australia at 28°35'S, New South Wales/Australia at 35°03'S, and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Apogonichthys ocellatus* (Weber, 1913) – Ocellate cardinal
Taxonomy. First record from Réunion by HARMELIN-VIVIEN (1976: 92); record confirmed by FRICKE (1999: 231–232), based on LEMUR and SMNS material.
Distribution. Réunion, Mauritius, Comores, Madagascar. Transitional water and marine. Found inshore, in estuaries and lagoons, underneath rocks or between algae, at depths of 0–5 m. Outside the area, East Africa east to Marquesas and Tuamotu islands, north to southern Japan, south to Western Australia, New Caledonia and Rapa.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Cheilodipterus lineatus* Lacepède [ex Commerson], 1801 – Large-toothed cardinalfish, lined cardinalfish, tiger cardinal; Apogon à grandes dents
Taxonomy. Originally described from Réunion as *Centropomus macrodon* by LACEPÈDE (1802: 252), which is a junior synonym of *Cheilodipterus lineatus* Lacepède [ex Commerson], 1801; the name was believed by several authors to be a secondary homonym of *Perca lineata* Forsskål in Niebuhr, 1775, which is, however, not a species independent from *Perca lineata* Linnaeus, 1758, but a misidentification (see FRICKE 1999: 233, 2008: 30), as both FORSSKÅL and NIEBUHR had the 10th edition of Systema naturae by LINNAEUS (1758) readily available (NIEBUHR 1775: 18), but did not give individual credit to the authors of the names they used; record of *Cheilodipterus lineatus* confirmed by FRICKE (1999: 232–233), based on MNHN material. Both names were frequently used, so there is at present no way avoiding to use *Cheilodipterus lineatus* as the valid name for the species recently named *Cheilodipterus macrodon* by other authors (e. g. GON & RANDALL 2003: 32–33).
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Marine species. Found in lagoon and

outer reef slopes, at depths of 0.5–40 m. Outside the area, Red Sea and East Africa east to Marshall Islands and Pitcairn Group, north to southern Japan, south to Western Australia, New South Wales/Australia, Lord Howe Island, Tonga and Rapa.

Conservation. Vulnerable in Réunion (VU). Threats: HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action.

*Cheilodipterus quinquelineatus* Cuvier in Cuvier & Valenciennes, 1828 – Sharptooth cardinalfish, five-lined cardinalfish; Apogon à cinq branches

Taxonomy. First record from Réunion by Fricke (1999: 233–234), based on MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Found on reef flats, in lagoon and outer reef slopes, at depths of 0–40 m. Outside the area, Red Sea and East Africa east to Marshall Islands and Pitcairn Group, north to Ogasawara Islands, south to Western Australia, Queensland/Australia, Lord Howe Island and Rapa.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Very sensitive to human activities. Probable decline. Medium priority for conservation action.

*Coranthus polyacanthus* (Vaillant, 1877) – Manyspine cardinalfish

Taxonomy. Originally described from Réunion as *Cheilodipterus polyacanthus* by Vaillant (1877: 29).

Distribution. Réunion, Mauritius, Comores, Madagascar. Marine species. Benthopelagic. Outside the area, east to Indonesia, north to southern Japan.

Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitive to human activities. Decline unknown. Low priority for conservation action.

*Nectamia savayensis* (Günther, 1872) – Savaii cardinalfish

Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 92) as *Ostorhynchus savayensis*; also listed by Fricke (1999: 228) as *Apogon fuscus* (non Quoy & Gaimard, 1825); record of *Apogon savayensis* confirmed by Fricke (1999: 230), based on MNHN and USNM material. Taxonomic decision of Fraser (2008: 32–37).

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Found between corals on lagoon reefs and outer reef slopes, at depths of 0–25 m, hiding during the day. Outside the area, East Africa east to Line Islands and Pitcairn Group, north to Ryukyu and Wake islands, south to northern Queensland/Australia, New Caledonia and Tonga.

Conservation. Vulnerable in Réunion (VU). Threats: HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Ostorhinchus angustatus* (Smith & Radcliffe in Radcliffe, 1911) – Broad-striped cardinalfish

Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 92) as *Ostorhynchus angustatus*; record confirmed by Fricke (1999: 224) as *Apogon angustatus*, based on MNHN and USNM material.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Agalega Islands, Cargados Carajos. Marine species. Found in clear water of seaward coral and rocky reefs, from the reef crest down to 25 m depth. Outside the area, Red Sea and East Africa east to Caroline and Line islands and Pitcairn Group, north to Taiwan, south to Western Australia, Queensland/Australia, New Caledonia and Tonga.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Ostorhinchus apogonoides* (Bleeker, 1856) – Shirt-tooth cardinalfish

Taxonomy. First record from Réunion by Letourneur (1998: 282) as *Apogon apogonoides*; record confirmed by Fricke (1999: 224), based on SAIAB material.

Distribution. Réunion, Mauritius, Madagascar. Marine species. Found on exposed rocky and coral reefs from shallow water down to 60 m depth. Outside the area, Red Sea, East and South Africa and Seychelles east to Philippines and Marquesas Islands, north to southern Japan, south to Queensland/Australia and Loyalty Islands.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Ostorhinchus aureus* (Lacepède [ex Commerson], 1802) – Bandtail cardinal; Apogon à queue bandée

Taxonomy. Originally described in part from Réunion by Lacepède (1802: 253, 273, 275–276) as *Centropomus aureus*; record confirmed by Fricke (1999: 225–226), based on SMNS material.

Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles. Marine species. Found in shallow water in coral reefs, at depths of 1–40 m, hiding during the day. Outside the area, Red Sea and East Africa east to Society Islands, north to Izu Islands, south to Western Australia at 28°45'S, New South Wales/Australia, New Caledonia and Tonga.

Conservation. Vulnerable in Réunion (VU). Threats: HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Ostorhinchus cookii* (Macleay, 1881) – Cook's cardinalfish

Taxonomy. **New record** from Réunion, based on a specimen collected during a visual census, in Saint-Paul Bay, at 15 m depth, in 2008 (T. Mulochau, P. Durville). Taxonomic decision of Randall (2005: 204)

Distribution. Réunion, Comores, Madagascar. Marine species. Found in coral and rocky reefs, resting in holes during the day, at depths of 0–5 m. Outside the area, Red Sea and East Africa east to Philippines, north to southern Japan, south to New Caledonia.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Ostorhinchus fasciatus* (White, 1790) – Broad-banded cardinalfish

Taxonomy. **New record** from Réunion; previously listed by Guichenot (1863: C23) as *Apogon quadrifasciatus* (non Cuvier in Cuvier & Valenciennes, 1828). Taxonomic decision of the present paper (named *Apogon fasciatus* by other authors).

Distribution. Réunion, Madagascar, Seychelles. Marine species. Found in sheltered water, in seagrass beds and near sea anemones, in coral reef lagoons, at depths of 0–80 m. Outside the area, Red Sea and East Africa south to Mozambique, east to Philippines and New Guinea, north to southern Japan, south to northern Australia.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Ostorhinchus taeniophorus* (Regan, 1908) – Reef-flat cardinalfish, ninestripe cardinal

Taxonomy. First record from Réunion by LETOURNEUR (1991: 164) as *Apogon taeniophorus*; record confirmed by FRICKE (1999: 230–231), based on BPBM, MNHN and SMNS material. Taxonomic decision of RANDALL (2005: 210).

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Found in caves and holes of outer reef flats exposed to surge, including tidal pools, at depths of 0–10 m. Outside the area, Red Sea, East and South Africa east to Kiribati/Line Islands and Pitcairn Group, north to southern Japan and Ogasawara Islands, south to Shark Bay/Western Australia, New South Wales/Australia at 28°39'S, New Caledonia and Rapa.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Pristiapogon fraenatus* (Valenciennes, 1832) – Bridled cardinalfish, spurcheek cardinal

Taxonomy. First record from Réunion by CHABANET (1994: 238) as *Apogon fraenatus*; record confirmed by FRICKE (1999: 227–228), based on MNHN and SMNS material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Found in relatively clear waters of reef flats and lagoon and seaward coral and rocky reefs, at depths of 1–25 m, hiding during the day. Outside the area, Red Sea, East and South Africa east to Line and Gambier islands, north to Ryukyu Islands, south to North West Cape/Western Australia, Sydney/New South Wales, New Caledonia and Austral Islands.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Pristiapogon kallopterus* (Bleeker, 1856) – Iridescent cardinalfish, spinyhead cardinal

Taxonomy. First record from Réunion by LETOURNEUR (1991: 164) as *Apogon kallopterus*; previously listed by HARMELIN-VIVIEN (1976: 92) as *Pristiapogon snyderi*; record of *Apogon kallopterus* confirmed by FRICKE (1999: 228–229), based on LEMUR, MNHN and SMNS material. Taxonomic decision of RANDALL (2005: 211).

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Found in relatively clear and silty waters on reef flats and lagoon and seaward coral and rocky reefs, at depths of 0–48 m, hiding during the day. Outside the area, Red Sea, East and South Africa east to Hawaiian Islands and Pitcairn Group, south to Western Australia, Queensland/Australia, Lord Howe and Kermadec islands, Tonga and Rapa.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Pristiapogon taeniopterus* (Bennett, 1836) – Bandfin cardinalfish

Taxonomy. **New record** from Réunion, based on specimens collected during a visual census, on the outer and inner reefs, in 2005 (T. MULOCHAU, P. DURVILLE). Taxonomic decision of RANDALL (2005: 211).

Distribution. Réunion, Mauritius, Madagascar, Cargados Carajos. Marine species. Found in coral and rocky reefs, resting in holes during the day, at depths of 1–82 m. Outside the area, tropical southern Indian Ocean east to Cocos-Keeling and Christmas islands (eastern Indian Ocean); New Caledonia east to Pitcairn Group; Marianas to Hawaiian and Line islands. Bipolar west-east distribution; no records from Australia and Indonesia to Japan.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Siphamia mossambica* Smith, 1955 – Sea urchin cardinalfish

Taxonomy. First record from Réunion by FRICKE (1999: 236), based on *Siphamia* sp. of HARMELIN-VIVIEN (1976: 92).

Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Found in lagoon habitats including tidal pools, between the spines of sea urchins, especially *Diadema* spp., at depths of 0–20 m. Outside the area, South and East Africa.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

### Epigonidae – Deepwater cardinalfishes

*Epigonus denticulatus* Dieuzeide, 1950 – Pencil cardinal

Taxonomy. First record from Réunion and the Mascarenes by FRICKE (1999: 236), based on MNHN material.

Distribution. Réunion. Marine species. Adults are benthic on the slope at depths of 130–830 m; juveniles pelagic at 130–425 m. Outside the area, cosmopolitan in tropical and temperate oceans.

Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitivity to human activities unknown. Decline unknown. Low priority for conservation action.

*Sphyraenops bairdianus* Poey, 1861 – Triplespine deepwater cardinalfish

Taxonomy. First record from Réunion by DURVILLE et al. (submitted), based on MHNRUN material.

Distribution. Réunion. Marine species. Bathypelagic, at depths of 200–1750 m. Outside the area, Western Atlantic, northwestern Australia, antiequatorial in western Pacific.

Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitivity to human activities unknown. Decline unknown. Low priority for conservation action.

### Sillaginidae – Sillagos

*Sillago sihama* (Forsskål in Niebuhr, 1775) – Silver sillago; Pêche-madame argenté

Taxonomy. First record from Réunion by BLEEKER (1874: 80).

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Freshwater, transitional water and marine. Found on sand bottom along beaches, in the lagoon and in estuaries and lower reaches of rivers and streams, at depths of 0–1 m. Outside the area, Red Sea, East and South Africa east to Philippines and Solomon Islands, north to Korea and southern Japan, south to Exmouth Gulf/Western Australia, Queensland/Australia at 21°09'S and New Caledonia.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, FIB, EUT, CON. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

### Malacanthidae – Tilefishes

*Branchiostegus doliatus* (Cuvier in Cuvier & Valenciennes, 1830) – Ribbed tilefish

Taxonomy. First record from Réunion by GUICHENOT (1863: C25)

as *Latilus doliatus*; record confirmed by Fricke (1999: 237), based on MHNRUN material.
Distribution. Réunion, Mauritius, Madagascar. Marine species. Found on soft bottoms, at depths of 90–400 m. Outside the area, Natal/South Africa to East Africa.
Conservation. Data deficient in Réunion (DD). Threats: FIT, FIB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Malacanthus brevirostris* Guichenot, 1848 – Stripetail tilefish, quakerfish; Matajuel nez court
Taxonomy. Original description in part from Réunion by Guichenot (1848: 14–15).
Distribution. Réunion, Mauritius, Madagascar. Marine species. Found in pairs over rocks or sandy areas adjacent to reefs, at depths of 5–50 m. Outside the area, Red Sea, East and South Africa east to Panama, north to Ryukyu Islands, south to Kimberleys/Western Australia, northern New Zealand and Austral Islands.
Conservation. Near threatened in Réunion (NT). Threats: FIT, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Malacanthus latovittatus* (Lacepède [ex Commerson], 1801) – Blue tilefish, blue blanquillo, striped blanquillo; Matajuel bleu
Taxonomy. First record from Réunion by Bleeker (1874: 80); previously listed by Guichenot (1863: C28) as *Malacanthus taeniatus*; record confirmed by Fricke (1999: 239–240), based on MHNRUN material.
Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles. Marine species. Found on soft bottoms adjacent to outer reef slopes, at depths of 5–60 m. Outside the area, Red Sea and East Africa east to Hawaiian Islands, Samoa and Tonga, north to southern Japan, south to Western Australia, New South Wales/Australia at 32°26'S, and New Caledonia.
Conservation. Near threatened in Réunion (NT). Threats: FIT, HAB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

### Coryphaenidae – Dolphinfishes

*Coryphaena equiselis* Linnaeus, 1758 – Pompano dolphinfish; Coryphène dauphin
Taxonomy. First record from Réunion by Fricke (1999: 257–258), based on MNHN material; listed as *C. equigalis* by Letourneur et al. (2004: 211).
Distribution. Réunion, Rodrigues. Marine species. Oceanic, pelagic, near the surface. Outside the area, worldwide in tropical and warm temperate seas.
Conservation. Threatened migrant in Réunion (TM). Threats: FIT, FIB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Coryphaena hippurus* Linnaeus, 1758 – Common dolphinfish; Coryphène
Taxonomy. First record from Réunion by Bleeker (1874: 97); record confirmed by Fricke (1999: 258), based on MHNRUN material.
Distribution. Réunion, Rodrigues. Marine species. Oceanic, pelagic, near the surface. Outside the area, worldwide in tropical and warm temperate seas.
Conservation. Threatened migrant in Réunion (TM). Threats: FIT, FIB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action. Highly migratory species, listed on Annex I of the 1982 Convention on the Law of the Sea (Anonymus 1994).

### Menidae – Moonfish

*Mene maculata* (Bloch & Schneider, 1801) – Moonfish; Luneur
Taxonomy. First record from Réunion by Heemstra (1984b: 2 unnumbered pp.); record confirmed by Fricke (1999: 259), based on MHNRUN material. Also described in an earlier, fragmentary, 1800 edition of Bloch & Schneider as discussed by Fricke (1999: 259).
Distribution. Réunion, Mauritius, Madagascar. Transitional water and marine. Found in deeper coastal waters near the bottom, sometimes in estuaries. Outside the area, Durban/South Africa and East Africa east to New Guinea, south to Western Australia and New South Wales/Australia.
Conservation. Data deficient in Réunion (DD). Threats: FIT, FIB, EUT. Sensitive to human activities. Probable decline. Low priority for conservation action.

### Echeneidae – Remoras

*Echeneis naucrates* Linnaeus, 1758 – Live sharksucker, shark remora; Pilote (Réunion)
Taxonomy. First record from Réunion by Bleeker (1874: 98) as *E. neucrates*; record confirmed by Fricke (1999: 241–242), based on MHNRUN and MNHN material.
Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Temporarily attached to a variety of hosts including sharks, rays, large bony fishes or sea turtles, whales, dolphins and also to ships; often found free-swimming in shallow inshore areas and around coral reefs. Outside the area, circumglobal in tropical and temperate oceans.
Conservation. Vulnerable in Réunion (VU). Threats: HOS. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Remora australis* (Bennett, 1840) – Whalesucker, whale remora; Rémora des baleines
Taxonomy. First record from Réunion and the Mascarenes by Fricke (1999: 242), based on MHNRUN material.
Distribution. Réunion. Marine species. Found attached to cetaceans. Outside the area, circumglobal in tropical and temperate oceans.
Conservation. Critically endangered in Réunion (CR), due to massive decline of host species. Threats: HOS. Very sensitive to human activities. Severe decline. High priority for conservation action. Proposed for Annexes II and IV of the EU Habitats Directive.

*Remora brachyptera* (Lowe, 1839) – Spearfish remora; Rémora des espadons
Taxonomy. First record from Réunion by Sauvage (1891: 321) as *Echeneis brachypterus*; record confirmed by Fricke (1999: 242), based on MNHN material.
Distribution. Réunion, Mauritius. Marine species. Found attached to sailfishes and swordfishes, rarely to other fish species. Outside the area, circumglobal in tropical and temperate oceans.
Conservation. Vulnerable in Réunion (VU), due to decline of host species. Threats: HOS. Very sensitive to human activities. Significant decline. High priority for conservation action. Proposed for Annexes II and IV of the EU Habitats Directive.

*Remora remora* (Linnaeus, 1758) – Common remora; Pilote (Réunion), rémora (France)
Taxonomy. First record from Réunion by GUICHENOT (1863: C29) as *Echeneis remora*; previously listed as *Echeneis bourboniensis* and *Echeneis remeligo* (nomina nuda) by DUMÉRIL (1858: 377), and described as *Echeneis remeligo* by DUMÉRIL in GUICHENOT (1863: C17–C19, C29) and as *Echeneis Borboniensis* by GUICHENOT (1863: C19–C20, C 29); record confirmed by FRICKE (1999: 242–243), based on MNHN material.
Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles. Transitional and marine water. Found attached to sharks but also attaches itself to other large fishes, sea turtles and even ships. Outside the area, circumglobal in tropical and temperate oceans.
Conservation. Near threatened in Réunion (NT). Threats: HOS. Sensitive to human activities. Significant decline. Low priority for conservation action.

## Carangidae – Jacks and pompanos

*Alectis indica* (Rüppell, 1830) – Indian mirrorfish, Indian threadfish; Carangue folle (Réunion)
Taxonomy. First record from Réunion by SAUVAGE (1891: 324–325) as *Seriolichthys indicus*; previously described as *Hynnis insanus* by VALENCIENNES (1862: 1203), and subsequently listed as *H. momsa* by FOURMANOIR & GUÉZÉ (1962a: 10).
Distribution. Réunion, Mauritius, Madagascar, Seychelles. Transitional water and marine. Adults found over coral reefs at 60–100 m depth, juveniles in shallow water of estuaries and coral reef lagoons. Outside the area, Red Sea, East and South Africa east to Tuamotu Archipelago, north to southern Japan, south to Western Australia at 28°50'S and New South Wales/Australia at 34°26'S.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Atule mate* (Cuvier in Cuvier & Valenciennes, 1833) – Yellowtail scad; Carangue maté
Taxonomy. First record from Réunion by LETOURNEUR (1992: unpag. 3) as *Caranx mate*.
Distribution. Réunion, Madagascar. Transitional water and marine. Found in estuaries and coastal bays, adjacent to coral reefs. Outside the area, East Africa east to Hawaiian Islands, Samoa and Tonga, north to southern Japan, south to Exmouth Gulf/Western Australia, New South Wales/Australia at 29°26'S, and New Caledonia.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Carangoides armatus* (Rüppell, 1830) – Longfin trevally, longfin kingfish; Carangue sap-sap
Taxonomy. First record from Réunion by FRICKE (1999: 244), based on MNHN material.
Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles. Transitional water and marine. Found in shallow coastal waters near rocks or corals; juveniles may enter estuaries. Outside the area, East London/South Africa and East Africa east to Gulf of Thailand and southern China, north to southern Japan.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Carangoides chrysophrys* (Valenciennes in Cuvier & Valenciennes, 1830) – Longnose trevally, longnose kingfish; Carangue cochon (Réunion), carangue tapir (France)
Taxonomy. First record from Réunion by FOURMANOIR & GUÉZÉ (1962a: 9–10) as *Caranx chrysophrys* and *Caranx malabaricus* (non Bloch & Schneider, 1801).
Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles. Transitional water and marine. Found over coastal reefs; juveniles may enter estuaries. Outside the area, Red Sea and East Africa east to Philippines and Fiji, north to Ryukyu Islands, south to Exmouth Gulf/Western Australia and New Caledonia.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Carangoides coeruleopinnatus* (Rüppell, 1830) – Coastal trevally, coastal kingfish; Carangue cochon (Réunion), carangue tapir (France)
Taxonomy. First record from Réunion by GUICHENOT (1863: C26) as *Caranx caeruleo pinnatus*.
Distribution. Réunion, Madagascar, Seychelles. Marine species. Found over coastal reefs, at depths of 1–60 m. Outside the area, Red Sea and East Africa east to Samoa and Tonga, north to southern Japan.
Conservation. Endangered in Réunion (EN). Threats: FIT, HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Carangoides ferdau* (Forsskål in Niebuhr, 1775) – Blue trevally; Carangue tachetée
Taxonomy. First record from Réunion by SMITH-VANIZ (1984: 2 unnumbered pp.).
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Marine species. Found in coastal waters over sand bottom near coral reefs, at depths of 1–60 m. Outside the area, Red Sea and East Africa eastward to Hawaiian and Line islands and Pitcairn Group, north to southern Japan, south to Western Australia, Norfolk Island and Rapa.
Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Very sensitive to human activities. Probable decline. Medium priority for conservation action.

*Carangoides fulvoguttatus* (Forsskål in Niebuhr, 1775) – Yellow-spotted trevally, yellow-dotted trevally; Carangue pailletée
Taxonomy. First record from Réunion by SMITH-VANIZ (1984: 2 unnumbered pp.).
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles, Cargados Carajos. Marine species. Found on rocky and coral reefs, at depths of 1–100 m. Outside the area, Red Sea and East Africa east to Palau/Belau and Vanuatu, north to Ryukyu Islands, south to Western Australia at 30°30'S, South Solitary Island/New South Wales, Australia, New Caledonia and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Carangoides gymnostethus* (Cuvier in Cuvier & Valenciennes, 1833) – Bludger; Carangue blanc (Réunion), carangue balo (France)
Taxonomy. First record from Réunion by SMITH-VANIZ (1984: 2 unnumbered pp.); previously listed by FOURMANOIR & GUÉZÉ (1962a: 9) as *Caranx gymnostethoides*.
Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles. Marine species. Found on deep offshore reefs close

to corals or rocks. Outside the area, Red Sea, East and South Africa east to Marshall and Tuamotu islands, north to Ryukyu Islands, south to Exmouth Gulf/Western Australia, Queensland/Australia, New Caledonia and Tonga.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Carangoides hedlandensis* (Whitley, 1934) – Bumpnose trevally; Carangue à longes nageoires
Taxonomy. First record from Réunion by Biais & Taquet (1992: 74); record confirmed by Letourneur et al. (2004: 211).
Distribution. Réunion, Seychelles. Transitional water and marine. Found in coastal waters near coral and rocky reefs; juveniles may enter estuaries. Outside the area, East and South Africa east to Philippines, Samoa and Tonga, north to southern Japan, south to Shark Bay/Western Australia, Queensland/Australia and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Carangoides oblongus* (Cuvier in Cuvier & Valenciennes, 1833) – Coachwhip trevally; Carangue oblongue
Taxonomy. First record from Réunion by Smith-Vaniz (1984: 2 unnumbered pp.).
Distribution. Réunion, Mauritius, Madagascar, Aldabra, Seychelles. Transitional water and marine. Found in coastal waters near coral and rocky reefs; juveniles may enter estuaries. Outside the area, Gulf of Aden, East and South Africa east to Fiji, north to southern Japan, south to Queensland/Australia.
Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Carangoides orthogrammus* (Jordan & Gilbert, 1882) – Island trevally; Carangue des Îles
Taxonomy. **New record** from Réunion, based on a specimen collected during a visual census, in Saint-Gilles harbour, in 2005 (T. Mulochau, P. Durville).
Distribution. Réunion, Seychelles. Marine species. Pelagic near coral and rocky reefs, at depths of 3–180 m. Outside the area, East Africa east to Hawaiian and Revillagigedo islands, north to Ryukyu Islands, south to Lord Howe Island.
Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Sensitive to human activities. Probable decline. Low priority for conservation action.

*Caranx heberi* (Bennett, 1830) – Blacktip trevally, blacktip kingfish; Carangue cocole
Taxonomy. First record from Réunion and the Mascarenes by Fricke (1999: 247), based on an underwater observation by Y. Letourneur.
Distribution. Réunion, Madagascar. Transitional water and marine. Found in clear coastal waters over rocky reefs, occasionally also in lagoons or estuaries. Outside the area, South and East Africa east to Fiji, north to Ryukyu Islands, south to northern Australia.
Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Caranx ignobilis* (Forsskål in Niebuhr, 1775) – Giant trevally; Carangue grosse tête (Réunion), carangue têtue (France)
Taxonomy. First record from Réunion by Fourmanoir & Guézé (1962a: 9); record confirmed by Fricke (1999: 247), based on MHNRUN and MNHN material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Transitional water and marine. Adults are found over clear lagoon and seaward coral reefs, juveniles in estuaries. Outside the area, East Africa east to Hawaiian and Line islands and Pitcairn Group, north to southern Japan, south to Western Australia, New South Wales/Australia, New Caledonia, Tonga and Rapa.
Conservation. Endangered in Réunion (EN). Threats: FIT, FIB, HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Caranx lugubris* Poey, 1860 – Black kingfish, black jack; Carangue noire (France)
Taxonomy. First record from Réunion by Smith-Vaniz (1984: 2 unnumbered pp.); record confirmed by Fricke (1999: 247), based on MHNRUN material.
Distribution. Réunion, Mauritius, Comores, Cargados Carajos. Marine species. Found on clear oceanic coral reefs or near drop-offs, at depths of 5–354 m. Outside the area, circumtropical, widespread but mostly restricted to oceanic insular habitats.
Conservation. Endangered in Réunion (EN). Threats: FIT, FIB, HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Caranx melampygus* Cuvier in Cuvier & Valenciennes, 1833 – Bluefin trevally, bluefin kingfish; Carangue bleu (Réunion), carangue aile bleue (France)
Taxonomy. First record from Réunion by Fourmanoir & Guézé (1962a: 8); record confirmed by Fricke (1999: 248), based on MHNRUN and MNHN material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Marine species. Adults found on coral or rocky reefs, juveniles inshore in sandy lagoons. Outside the area, Red Sea, East and South Africa east to Panama, north to Izu and Ogasawara islands, south to Dampier Archipelago/Western Australia, New South Wales/Australia, Norfolk Island and Rapa.
Conservation. Endangered in Réunion (EN). Threats: FIT, FIB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Caranx papuensis* Alleyne & Macleay, 1877 – Brassy trevally, brassy kingfish; Carangue bronze
Taxonomy. First record from Réunion by Fricke (1999: 248–249), based on MNHN material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Freshwater, transitional water and marine. Found in lagoon and seaward coral reefs, occasionally entering rivers and streams. Outside the area, East and South Africa east to Marshall and Marquesas islands, north to Ryukyu Islands, south to Timor Sea/Western Australia, Queensland/Australia at 27°23'S, and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT, CON. Very sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Caranx sexfasciatus* Quoy & Gaimard, 1825 – Bigeye trevally, bigeye kingfish; Carangue (Réunion), carangue vorace (France)
Taxonomy. First record from Réunion by Smith-Vaniz (1984: 2 unnumbered pp.); previously listed by Bleeker (1874) as

*Carangus hippos* (non Linné, 1766), and by SAUVAGE (1891: 323) as *Caranx carangus* (non Bloch, 1793); record confirmed by FRICKE (1999: 249–250), based on MNHN and USNM material.
Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles, Cargados Carajos. Freshwater, transitional water and marine. Found in lagoon and seaward coral reefs, occasionally entering rivers and streams. Outside the area, Red Sea, East and South Africa east to Hawaiian and Marquesas islands, south to Point Quobba/Western Australia, New South Wales/Australia, Norfolk and Austral islands; Galapagos Islands and Mexico to Ecuador.
Conservation. Endangered in Réunion (EN). Threats: FIT, HAB, EUT, CON. Very sensitive to human activities. Significant decline. High priority for conservation action.

*Decapterus kurroides* Bleeker, 1855 – Redtail scad; Comète maouane
Taxonomy. First record from Réunion by SMITH-VANIZ (1984: 2 unnumbered pp.).
Distribution. Réunion. Marine species. Found near reefs along slopes in deep water. Outside the area, East Africa east to Philippines, north to southern Japan, south to Onslow/Western Australia at 19°27'S.
Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Decapterus macarellus* (Cuvier in Cuvier & Valenciennes, 1833) – Mackerel scad; Bancloche (Réunion), comète macquereau (France)
Taxonomy. First record from Réunion by SMITH-VANIZ (1984: 2 unnumbered pp.); previously listed as *D. macrosoma* (non Bleeker, 1851) and *D. Russelli* (non Rüppell, 1830) by FOURMANOIR & GUÉZÉ (1962a: 3, 5); record of *D. macarellus* confirmed by FRICKE (1999: 250), based on MNHN material.
Distribution. Réunion, Mauritius, Aldabra, Seychelles, Cargados Carajos. Marine species. Found near clear reefs from shallow water to 20 m depth. Outside the area, circumtropical.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Elagatis bipinnulata* (Quoy & Gaimard, 1825) – Rainbow runner; Saumon, dauphin (Réunion), comète saumon (France)
Taxonomy. First record from Réunion by SMITH-VANIZ (1984: 2 unnumbered pp.); previously described as *Irex indicus* by VALENCIENNES (1862: 1205); record of *Elagatis bipinnulata* confirmed by FRICKE (1999: 250–251), based on MHNRUN material.
Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles. Marine species. Associated with coral or rocky reefs. Outside the area, circumtropical.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Gnathanodon speciosus* (Forsskål in Niebuhr, 1775) – Golden kingfish, golden trevally; Carangue royale jaune
Taxonomy. First record from Réunion by SMITH-VANIZ (1984: 2 unnumbered pp.).
Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles. Marine species. Found over sand bottom associated to seaward coral reefs. Juveniles live among the tentacles of jellyfish. Outside the area, Red Sea, East and South Africa east to Panama, north to Ryukyu and Hawaiian islands, south to Shark Bay/Western Australia, New South Wales/Australia at Sydney, New Caledonia, Tonga and Austral Islands.
Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Very sensitive to human activities. Probable decline. Medium priority for conservation action.

*Naucrates ductor* (Linnaeus, 1758) – Pilotfish; Poisson pilote
Taxonomy. First record from Réunion by BLEEKER (1874: 98); previously listed as *N. indicus* by GUICHENOT (1863: C26).
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar. Marine species. Pelagic, oceanic species with a semi-obligate commensal relationship with sharks, rays, larger bony fishes and turtles; juveniles usually associated with jellyfish and drifting seaweed. Outside the area, worldwide in tropical and temperate seas.
Conservation. Near threatened in Réunion (NT). Threats: FIB, HOS. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Parastromateus niger* (Bloch, 1795) – Black pomfret; Castagnoline noire
Taxonomy. First record from Réunion by SMITH-VANIZ (1984: 2 unnumbered pp.).
Distribution. Réunion, Mauritius, Madagascar, Seychelles. Transitional water and marine. Inhabits coastal areas with muddy substrate; found near the bottom during daytime and near the surface at night; enters estuaries. Outside the area, worldwide in tropical and temperate seas. South and East Africa east to Philippines, north to southern Japan and Ogasawara Islands, south to Queensland/Australia.
Conservation. Data deficient in Réunion (DD). Threats: FIT, FIB. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Pseudocaranx dentex* (Bloch & Schneider, 1801) – White trevally, white kingfish; Carangue dentue
Taxonomy. First record from Réunion and the Mascarenes by FRICKE (1999: 253), based on MHNRUN material. FRICKE (1999: 253) dated this species to an 1800 edition of BLOCH & SCHNEIDER of which only a fragment of the text remains (see FRICKE 1999: 666); that edition should be placed on the Official Index of Rejected Works according to ESCHMEYER & FRICKE (2008).
Distribution. Réunion. Transitional water and marine. Found in bays and coastal waters close to coral reefs, also entering estuaries (especially juveniles). Outside the area, South Africa, southern Australia; eastern Australia east to Easter Island, south to Lord Howe Island, northern New Zealand and Rapa; Japan, Hawaiian Islands, tropical and warm temperate Atlantic Ocean including Mediterranean Sea.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Scomberoides commersonianus* Lacepède [ex Commerson], 1801 – Talang queenfish; Lubine, sauteur talang
Taxonomy. First record from Réunion by BLEEKER (1874: 98); previously listed as *Chorinemus Commersonii* by GUICHENOT (1863: C26).
Distribution. Réunion, Mauritius, Madagascar. Transitional water and marine. Found in coastal waters, often near coral reefs, also entering estuaries. Outside the area, East Africa east to Philippines, north to southern Japan, south to Exmouth Gulf/Western Australia, Sydney/New South Wales and New Caledonia.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB,

EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Scomberoides lysan* (Forsskål in Niebuhr, 1775) – Double-spotted queenfish, leatherback; Pompre, sauteur sabre
Taxonomy. First record from Réunion by Fourmanoir & Guézé (1962a: 13, 14) as *Chorinemus lysan*, *C. sanctipetri* and *C. tol* (non Cuvier in Cuvier & Valenciennes, 1832); previously listed as *C. sancti Petri* and *C. mauritianus* by Guichenot (1863: C26); record confirmed by Fricke (1999: 254–255), based on MHNRUN and MNHN material.
Distribution. Réunion. Transitional water and marine. Adults found in clear lagoon and seaward coral reefs, juveniles inshore and in estuaries. Outside the area, Red Sea, East and South Africa east to Hawaiian Islands, north to Ryukyu Islands, south to Exmouth Gulf/Western Australia, New South Wales/Australia at Sydney, New Caledonia, Tonga and Rapa.
Conservation. Endangered in Réunion (EN). Threats: FIT, HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Selar crumenophthalmus* (Bloch, 1793) – Bigeye scad; Pêche cavale du large, chinard (Réunion), selar coulisou (France)
Taxonomy. First record from Réunion by Bleeker (1874: 99) as *Caranx crumenophthalmus*; previously listed as *C. Mauritianus* by Guichenot (1863: C26); record confirmed by Fricke (1999: 255), based on MHNRUN and MNHN material.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Marine species. Pelagic in clear oceanic water close to islands. Outside the area, worldwide in tropical and subtropical seas.
Conservation. Near threatened in Réunion (NT). Threats: FIT, EUT. Annual catch in Réunion estimated at 100 tonnes (Roux & Conand 2000: 173). Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Seriola lalandi* Valenciennes in Cuvier & Valenciennes, 1833 – Yellowtail amberjack; L'Amoureuse grosse (Réunion), sériole chicard (France)
Taxonomy. First record from Réunion by Biais & Taquet (1992: 74).
Distribution. Réunion, Mauritius, Amsterdam Island, Walters Shoal, Comores. Transitional water and marine. Pelagic in coastal waters near coral reefs, sometimes entering estuaries. Outside the area, South Africa east to southern Australia, Western Australia north to Shark Bay, southern Japan, Hawaiian Islands, eastern Australia east to Easter Island, Nazca and Sala-y-Gomez ridges.
Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Seriola rivoliana* Valenciennes in Cuvier & Valenciennes, 1833 – Almaco jack, longfin yellowtail; Sériole limon
Taxonomy. First record from Réunion by Fricke (1999: 256); previously listed by Fourmanoir & Guézé (1962a: 11) as *S. songoro*.
Distribution. Réunion, Mauritius, Rodrigues. Marine species. Pelagic near outer coral reef slopes at depths of 5–160 m; juveniles associated with floating objects. Outside the area, East Africa east to Hawaiian Islands and Pitcairn Group, north to southern Japan, south to Dampier Archipelago/Western Australia, New South Wales/Australia, Lord Howe and Kermadec islands, and Tonga.
Conservation. Near threatened in Réunion (NT). Threats: FIT, HAB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Seriolina nigrofasciata* (Rüppell, 1829) – Black-banded trevally; L'Amoureuse petite (Réunion), sériole amourez (France)
Taxonomy. First record from Réunion by Fourmanoir & Guézé (1962a: 12).
Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles. Marine species. Pelagic above rock bottoms, at depths of 20–150 m. Outside the area, Red Sea, East and South Africa east to Philippines, north to southern Japan, south to Queensland/Australia.
Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Trachinotus baillonii* (Lacepède [ex Commerson], 1801) – Small-spotted pompano; Lime (Réunion), pompaneau muscadin (France)
Taxonomy. First record from Réunion by Guichenot (1863: C26) as *T. Bailloni*; record confirmed by Fricke (1999: 257), based on MHNRUN and MNHN material.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Marine species. Found near the surface in lagoon and seaward coral reefs, occurring in schools near the edge of the surf. Outside the area, East Africa east to northern Line and Gambier islands, north to southern Japan, south to Western Australia, New South Wales/Australia, Lord Howe Island, Tonga and Rapa.
Conservation. Endangered in Réunion (EN). Threats: FIT, HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Trachinotus blochii* (Lacepède [ex Commerson], 1801) – Snubnose pompano; Pompaneau lune
Taxonomy. First record from Réunion by Blanc & Postel (1958: 369, 373) as *T. Blochi*.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Marine species. Found near the surface in lagoon and seaward coral reefs, occurring in schools near the edge of the surf. Outside the area, East Africa east to Marshall Islands, Samoa and Tonga, north to southern Japan, south to Western Australia and New Caledonia.
Conservation. Endangered in Réunion (EN). Threats: FIT, HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Uraspis uraspis* (Günther, 1860) – Whitetongue jack; Carangue paia
Taxonomy. First record from Réunion by Letourneur et al. (2004: 204).
Distribution. Réunion. Marine species. Pelagic on the continental shelf, at depths of 20–130 m. Outside the area, Red Sea and East Africa east to Hawaiian Islands, north to Ryukyu Islands, south to northern Australia.
Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

### Leiognathidae – Ponyfishes

*Gazza dentex* (Valenciennes in Cuvier & Valenciennes, 1835) – Ovoid toothpony; Ambache blanc (Réunion), sapsap dentu (France)
Taxonomy. First record from Réunion by Guichenot (1863: C26)

as *Equula dentex*; record confirmed by FRICKE (1999: 259–260), based on MNHN material.
Distribution. Réunion, Mauritius, Rodrigues, Seychelles. Transitional water and marine. Found over sandy or muddy bottoms, at depths of 1–20 m. Outside the area, east to Indonesia, north to Thailand, south to northern Australia.
Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Leiognathus dussumieri* (Valenciennes in Cuvier & Valenciennes, 1835) – Dussumier's ponyfish; Sapsap vaguelette
Taxonomy. First record from Réunion by JAMES et al. (1984: 2 unnumbered pp.).
Distribution. Réunion, Madagascar. Transitional water and marine. Found over coral sand bottoms in inshore waters, but also entering estuaries. Outside the area, India east to Indonesia and Philippines.
Conservation. Data deficient in Réunion (DD). Threats: FIT, FIB, EUT. Rare. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Leiognathus equulus* (Forsskål in Niebuhr, 1775) – Common ponyfish, slimy, common slipmouth; Sapsap commun
Taxonomy. First record from Réunion by JAMES (1975: 145–147); previously listed as *Equula ensifera* by GUICHENOT (1863: C26), and as *L. edentulus* by BLEEKER (1874: 98); record confirmed by FRICKE (1999: 260), based on MNHN material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Transitional water and marine. Found in river mouths and muddy inshore areas, often in mangrove areas, and on soft bottoms down to 70 m depth. Outside the area, Red Sea, East Africa east to eastern Caroline Islands, north to Ryukyu Islands, south to Western Australia at Broome, Queensland/Australia at Townsville, and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: FIT, FIB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Leiognathus longispinis* (Valenciennes in Cuvier & Valenciennes, 1835)
Taxonomy. **New record** from Réunion, based on a specimen observed and photographed during a visual census, in collaboration with local fishermen, in Saint-Gilles harbour, in 2008 (T. MULOCHAU, P. DURVILLE).
Distribution. Réunion, Seychelles. Marine species. Found in coastal waters near the substrate, at depths of 0–10 m. Outside the area, India east to Palawan/Philippines, north to Gulf of Thailand, south to Onslow/Western Australia.
Conservation. Data deficient in Réunion (DD). Threats: FIT, FIB, EUT. Sensitive to human activities. Decline unknown. Low priority for conservation action.

### Bramidae – Pomfrets

*Brama dussumieri* Cuvier in Cuvier & Valenciennes, 1831 – Lesser bream; Castagnole mignonne
Taxonomy. First record from Réunion by HAEDRICH (1984: 2 unnumbered pp.).
Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Pelagic, at depths of 1–300 m. Outside the area, circumtropical.
Conservation. Threatened migrant in Réunion (TM). Threats: FIB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action. Highly migratory species, listed on Annex I of the 1982 Convention on the Law of the Sea (Anonymus 1994).

*Brama orcini* Cuvier in Cuvier & Valenciennes, 1831 – Bigtooth pomfret
Taxonomy. **New record** from Réunion, based on photographed specimens collected by local fishermen, off Saint-Paul, at 450 m depth, in 2004 (P. DURVILLE, E. TESSIER, T. MULOCHAU).
Distribution. Réunion. Marine species. Benthopelagic, at depths of 1–1229 m. Outside the area, widespread in tropical and warm temperate parts of Indian and Pacific oceans.
Conservation. Threatened migrant in Réunion (TM). Threats: FIB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action. Highly migratory species, listed on Annex I of the 1982 Convention on the Law of the Sea (Anonymus 1994).

*Eumegistus illustris* Jordan & Jordan, 1922 – Brilliant pomfret; Castagnole mignonne
Taxonomy. First record from Réunion by LETOURNEUR et al. (2004: 204), based on MNHN material.
Distribution. Réunion. Marine species. Engybenthic and benthopelagic, at depths of 1–520 m. Outside the area, western Indian Ocean and western and central Pacific.
Conservation. Threatened migrant in Réunion (TM). Threats: FIB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action. Highly migratory species, listed on Annex I of the 1982 Convention on the Law of the Sea (Anonymus 1994).

*Pteraclis velifera* (Pallas, 1770) – Spotted fanfish
Taxonomy. First record from Réunion by FRICKE (1999: 262–263); previously listed as *Pteraclis trichipterus* by BLEEKER (1874: 98).
Distribution. Réunion, Mauritius, Walters Shoal, Madagascar. Marine species. Pelagic species found in open, offshore water. Outside the area, South Africa to Mozambique.
Conservation. Threatened migrant in Réunion (TM). Threats: FIB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action. Highly migratory species, listed on Annex I of the 1982 Convention on the Law of the Sea (Anonymus 1994).

*Pterycombus petersii* (Hilgendorf, 1787) – Prickly pomfret
Taxonomy. First record from Réunion by DURVILLE et al. (submitted), based on MHNRUN material.
Distribution. Réunion. Marine species. Pelagic species found in open, offshore water. Outside the area, widespread in tropical and temperate waters of Indian and Pacific oceans.
Conservation. Threatened migrant in Réunion (TM). Threats: FIB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action. Highly migratory species, listed on Annex I of the 1982 Convention on the Law of the Sea (Anonymus 1994).

*Taractichthys steindachneri* (Döderlein in Steindachner & Döderlein, 1883) – Sickle pomfret
Taxonomy. First record from Réunion and the Mascarenes by FRICKE (1999: 263), based on MHNRUN material.
Distribution. Réunion. Marine species. Pelagic species found in open, offshore water. Outside the area, widespread in tropical and warm temperate Indian and Pacific oceans.
Conservation. Threatened migrant in Réunion (TM). Threats: FIB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action. Highly migratory spe-

cies, listed on Annex I of the 1982 Convention on the Law of the Sea (Anonymus 1994).

### Lutjanidae – Snappers

*Aphareus furca* (Lacepède [ex Commerson], 1801) – Blue smalltooth jobfish; Lantanier noir (Réunion), vivaneau tidents (France)

Taxonomy. First record from Réunion by Bleeker (1874: 91) as *A. furcatus*; previously listed as *A. caerulescens* by Guichenot (1863: C25); record confirmed by Fricke (1999: 263–264), based on MHNRUN material.

Distribution. Réunion, Mauritius, Comores, Seychelles. Marine species. Found in lagoons, coral and rocky reefs, at depths of 1–122 m. Outside the area, East Africa east to Hawaiian Islands and Pitcairn Group, north to southern Japan, south to northern Western Australia, New Caledonia and Tonga.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action. Proposed for Annex II of the EU Habitats Directive.

*Aphareus rutilans* Cuvier in Cuvier & Valenciennes, 1830 – Red smalltooth jobfish, rusty jobfish; Vivaneau lantanier (Réunion), vivaneau rouillé (France)

Taxonomy. First record from Réunion by Guichenot (1863: C25).

Distribution. Réunion, Mauritius, Rodrigues, Comores, Seychelles. Marine species. Found over coral and rocky reefs, at depths of 50–350 m. Outside the area, East Africa east to Hawaiian Islands, north to southern Japan and Ogasawara Islands, south to northern Western Australia, Queensland/Australia, New Caledonia and Tonga.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action. Proposed for Annex II of the EU Habitats Directive.

*Aprion virescens* Valenciennes in Cuvier & Valenciennes, 1830 – Green jobfish; Thazard blanc (Réunion), vivaneau job (France)

Taxonomy. First record from Réunion by Guichenot (1863: C24); record confirmed by Fricke (1999: 264–265), based on MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Cargados Carajos, Seychelles. Marine species. Found in open waters of deep lagoons, channels, or seaward reefs, at depths of 1–180 m. Outside the area, East Africa east to Hawaiian and Marquesas islands, north to southern Japan, south to Port Hedland/Western Australia, New South Wales/Australia, Lord Howe Island, and Tonga.

Conservation. Endangered in Réunion (EN). Threats: FIT, HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Etelis carbunculus* Cuvier in Cuvier & Valenciennes, 1828 – Ruby snapper; Vivaneau rouge (Réunion), vivaneau rubis (France)

Taxonomy. First record from Réunion by Guichenot (1863: C23); listed as *Etelis Marshi* by Guézé & Fourmanoir (1960: 8, 19); record confirmed by Fricke (1999: 265), based on MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Seychelles. Marine species. Found above rock bottoms, at depths of 90–350 m. Outside the area, East Africa east to Hawaiian, Kiribati/Line and Austral islands, north to southern Japan, south to off Kimberleys/Western Australia, northern New Zealand, and Tonga.

Conservation. Data deficient in Réunion (DD). Threats: FIT, FIB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Etelis coruscans* Valenciennes, 1862 – Flame snapper; Vivaneau flamme

Taxonomy. First record from Réunion by Guichenot (1863: C23); listed as *E. oculatus* (non Cuvier in Cuvier & Valenciennes, 1828) by Vaillant (1873: 71); record confirmed by Fricke (1999: 265–266), based on MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Comores, Seychelles. Marine species. Found above rock bottoms, at depths of 90–350 m. Outside the area, East Africa east to Hawaiian Islands and Samoa, north to southern Japan, south to Western Australia, New South Wales/Australia, Lord Howe and Kermadec islands, and Tonga.

Conservation. Data deficient in Réunion (DD). Threats: FIT, FIB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Etelis radiosus* Anderson, 1981 – Scarlet snapper; Vivaneau écarlate

Taxonomy. **New record** from Réunion, based on photographed specimens collected by local fishermen, off Saint-Paul, at 370 m depth, in 2005 (P. Durville, E. Tessier, T. Mulochau).

Distribution. Réunion. Marine species. Found on rocky bottoms, at depths of 90–360 m. Outside the area, Sri Lanka east to Caroline Islands, north to Ryukyu Islands, south to New Caledonia.

Conservation. Data deficient in Réunion (DD). Threats: FIT, FIB, EUT. Sensitive to human activities. Probable decline. Low priority for conservation action.

*Lutjanus argentimaculatus* (Forsskål in Niebuhr, 1775) – River snapper, mangrove red snapper; Vivaneau des mangroves (France)

Taxonomy. First record from Réunion by Allen & Talbot (1985: 19–21); listed as *Mesoprion griseoides* by Guichenot (1863: C2–C3, C23); record confirmed by Fricke (1999: 265–266), based on MNHN material.

Distribution. Réunion, Mauritius, Comores, Madagascar, Aldabra, Seychelles. Freshwater, transitional water and marine. Juveniles and young adults occur in estuaries, the lower reaches of freshwater streams and tidal creeks; adults are often found in groups around coral or rocky reefs; at depths of 0–100 m. Outside the area, Red Sea and East Africa east to Kiribati/Line and Society islands, north to Ryukyu Islands, south to Derby/Western Australia, New South Wales/Australia, and Tonga, immigrated through the Suez Canal into the eastern Mediterranean.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Lutjanus bengalensis* (Bloch, 1790) – Bengal snapper; Jaune de côte (Réunion), vivaneau du Bengale (France)

Taxonomy. First record from Réunion by Bleeker (1874: 27–32, 35–37, 90) as *Lutjanus bengalensis* and *L. octovittatus*; previously listed as *Diacope octolineata* by Guichenot (1863: C23).

Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Found over rocky and coral reefs, at depths of

0–30 m. Outside the area, Red Sea and East Africa east to Sumatera/Indonesia, north to Gulf of Oman.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Lutjanus bohar* (Forsskål in Niebuhr, 1775) – Twinspot snapper; Vara-vara (Réunion), vivaneau chien rouge (France)
Taxonomy. First record from Réunion by Bleeker (1874: 90); record confirmed by Fricke (1999: 268), based on MNHN material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Marine species. Found in coral reefs including lagoons, at depths of 0–100 m. Outside the area, East Africa east to Kiribati/Line Islands and Pitcairn Group, north to Ryukyu Islands, south to off northern Western Australia, Lord Howe and Austral islands.
Conservation. Endangered in Réunion (EN). Threats: FIT, FIB, HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Lutjanus fulviflamma* (Forsskål in Niebuhr, 1775) – Dory snapper, blackspot snapper; Vivaneau gibelot (France)
Taxonomy. First record from Réunion by Blanc & Postel (1958: 368) as *Lutianus fulviflamma*; record confirmed by Fricke (1999: 268–269), based on MNHN material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles, Cargados Carajos. Freshwater, transitional water and marine. Found in coral reefs including sheltered lagoons, estuaries and lower reaches of rivers and streams, at depths of 0–35 m. Outside the area, East Africa east to Philippines, Samoa and Tonga, north to Ryukyu Islands, south to Western Australia and Lord Howe Island.
Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Lutjanus fulvus* (Schneider [ex Forster] in Bloch & Schneider, 1801) – Yellow striped snapper, flametail snapper; Dorée (Réunion), vivaneau queue noire (France)
Taxonomy. First record from Réunion by Allen et al. (1984: 2 unnumbered pp.); previously listed as *Diacope analis* and *D. marginata* by Guichenot (1863: C23), and as *Lutjanus vaigiensis* by Fourmanoir & Guézé (1962b: 12); record confirmed by Fricke (1999: 269–270), based on MHNRUN and MNHN material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar. Freshwater, transitional water and marine. Found in lagoon and semi-protected seaward coral and rocky reefs; juveniles sometimes in estuaries and the lower parts of freshwater streams; at depths of 0–75 m. Outside the area, East Africa east to Kiribati/Line and Marquesas islands, north to southern Japan, south to Queensland/Australia, Norfolk Island and Rapa, introduced to Hawaiian Islands.
Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Lutjanus gibbus* (Forsskål in Niebuhr, 1775) – Humpback snapper; Marie-Therèse (Réunion), vivaneau pagaie (France)
Taxonomy. First record from Réunion by Allen et al. (1984: 2 unnumbered pp).
Distribution. Réunion, Mauritius, Comores, Madagascar, Aldabra, Seychelles. Marine species. Found in coral reefs, at depths of 0–100 m, juveniles in seagrass beds or mixed sand and coral habitats. Outside the area, East Africa east to Kiribati/Line Islands and Tonga, north to southern Japan, south to Western Australia, Queensland/Australia and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: FIT, FIB, HAB, EUT. Very sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Lutjanus kasmira* (Forsskål in Niebuhr, 1775) – Blue-banded snapper, blue-lined snapper; Le petite jaune (Réunion), vivaneau à raies bleues (France)
Taxonomy. First record from Réunion by Blanc & Postel (1958: 368); record confirmed by Fricke (1999: 271–272), based on MNHN material. Also MHNRUN material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles. Marine species. Found in coral and rocky reefs, at depths of 0–100 m, juveniles in seagrass beds or patch reefs. Outside the area, Red Sea and East Africa east to Kiribati/Line Islands and Pitcairn Group, north to southern Japan and Ogasawara Islands, south to off Western Australia, Lord Howe and Kermadec islands, and Rapa.
Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Lutjanus monostigma* (Cuvier in Cuvier & Valenciennes, 1828) – Onespot snapper; Vivaneau églefin
Taxonomy. First record from Réunion by Allen et al. (1984: 2 unnumbered pp.).
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Aldabra, Seychelles. Marine species. Found in coral reefs, at depths of 1–60 m, usually close to shelter. Outside the area, East Africa east to Kiribati/Line Islands and Pitcairn, north to Ryukyu Islands, south to off northwestern Australia, Queensland/Australia, New Caledonia and Rapa.
Conservation. Endangered in Réunion (EN). Threats: FIT, HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Lutjanus notatus* (Cuvier in Cuvier & Valenciennes, 1828) – Blue-striped snapper; Jaune de fond (Réunion), vivaneau à raies bleues (France)
Taxonomy. First record from Réunion by Allen & Talbot (1985: 62–63); previously listed as *Diacope duodecimlineata* and *D. decemlineata* by Guichenot (1863: C23), and as *Lutjanus quinquelineatus* (non Bloch, 1790) by Bleeker (1874: 33–35, 91); record confirmed by Fricke (1999: 273–274), based on MHNRUN and MNHN material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar. Marine species. Found in coral and rocky reefs, at depths of 5–50 m. Outside the area, East Africa to Durban/South Africa.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Lutjanus rivulatus* (Cuvier in Cuvier & Valenciennes, 1828) – Scribbled snapper, speckled snapper; Lèvre de bœuf, bonhomme tombé (Réunion), vivaneau maori (France)
Taxonomy. First record from Réunion by Guichenot (1863: C23) as *Diacope rivulata* and *D. albo-guttata*.
Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles. Freshwater, transitional water and marine. Occasionally encountered in coral reefs or shallow inshore flats; adults on deep coastal slopes, down to 100 m depth, juve-

niles on shallow algae-reef flats, often near freshwater runoffs. Outside the area, East Africa east to Palau/Belau and Society Islands, north to southern Japan, south to Exmouth Gulf/Western Australia, Queensland/Australia, New Caledonia and Tonga.

Conservation. Data deficient in Réunion (DD). Threats: FIT, FIB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Lutjanus russellii* (Bleeker, 1849) – Russell's snapper; Doret batard (Réunion), vivaneau hublot (France)

Taxonomy. First record from Réunion by Biais & Taquet (1992: 74); record confirmed by Fricke (1999: 275), based on MNHN material.

Distribution. Réunion, Mauritius, Comores, Madagascar. Freshwater, transitional water and marine. Inhabits offshore coral reefs and also inshore rocky and coral reefs, at depths of 0–80 m; juveniles in estuaries and lower reaches of freshwater streams. Outside the area, East Africa east to Philippines, Samoa and Tonga, north to southern Japan, south to Western Australia, Queensland/Australia, and New Caledonia.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Lutjanus sebae* (Cuvier, 1816) – Emperor snapper; Vivaneau bourgeois

Taxonomy. First record from Réunion by Guichenot (1863: C23) as *Diacope sebae*.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Freshwater, transitional water and marine. Found in the vicinity of coral or rocky reefs, often over adjacent sand flats and gravel patches, also in deeper water on relatively flat bottoms; juveniles frequently commensal with sea urchins. Outside the area, southern Red Sea and East Africa east to Philippines and Solomon Islands, north to southern Japan, south to Exmouth Gulf/Western Australia, New South Wales/Australia and New Caledonia.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, FIB, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Macolor niger* (Forsskål in Niebuhr, 1775) – Black snapper, black-and-white snapper; Vivaneau plate

Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 93).

Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles. Marine species. Found on steep outer walls of lagoon, channel and seaward coral reef slopes, at depths of 1–90 m. Outside the area, Red Sea and East Africa east to Marshall Islands, Samoa and Tonga, north to southern Japan, south to off northwestern Australia and New Caledonia.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Very sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Paracaesio xanthura* (Bleeker, 1869) – Yellowtail blue snapper, yellowtail fusilier; Cendré, batavia noir (Réunion), vivanette queue jaune (France)

Taxonomy. First record from Réunion by Blanc & Postel (1958: 368, 369, 370, 373) as *Caesio xanthurus* and *Aetiasis cantharoides*; previously listed as *Apsilus fuscus* (non Valenciennes in Cuvier & Valenciennes, 1830) by Guichenot (1863: C24); record confirmed by Fricke (1999: 276–277), based on MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles. Marine species. Found above rocky bottoms and coral reefs, at depths of 5–250 m. Outside the area, East Africa east to Marshall Islands, north to southern Japan, south to New South Wales/Australia, Lord Howe, Kermadec and Austral islands.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action. Proposed for Annexes II and V of the EU Habitats Directive.

*Pristipomoides argyrogrammicus* (Valenciennes in Cuvier & Valenciennes, 1832) – Ornate jobfish; Vivaneau rayé, cerf volant (Réunion), colas orné (France)

Taxonomy. First record from Réunion by Guichenot (1863: C23) as *Serranus argyro-grammiscus*; record confirmed by Fricke (1999: 277), based on MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles. Marine species. Found above rocky bottoms, at depths of 70–350 m. Outside the area, East Africa east to Marshall and Society islands, north to southern Japan, south to off northwestern Australia, Queensland/Australia, New Caledonia and Tonga.

Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Pristipomoides auricilla* (Jordan, Evermann & Tanaka, 1927) – Goldflag jobfish; Colas drapeau

Taxonomy. First record from Réunion by Fricke (1999: 277), based on MHNRUN material.

Distribution. Réunion, Rodrigues, Comores. Marine species. Found above rocky bottoms, at depths of 90–360 m. Outside the area, Andaman Sea east to Hawaiian Islands and Rapa, north to southern Japan, south to off northwestern Australia, Queensland/Australia, New Caledonia and Tonga.

Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Pristipomoides filamentosus* (Valenciennes in Cuvier & Valenciennes, 1830) – Rosy jobfish, blue-spotted jobfish, crimson jobfish; Vivaneau commun, vivaneau blanc (Réunion), colas fil (France)

Taxonomy. Originally described from Réunion as *Serranus filamentosus* by Valenciennes in Cuvier & Valenciennes (1830b: 509–509), and listed as *Aprion brevirostris* by Valenciennes in Guichenot (1863: C24, nomen nudum) and Bleeker (1874: 90), and *Aprion (Aprion) microlepis* by Bleeker (1874: 26–27); record confirmed by Fricke (1999: 278), based on MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Comores. Marine species. Found above rocky bottoms, at depths of 40–400 m. Outside the area, East Africa east to Hawaiian and Society islands, north to southern Japan, south to off northwestern Australia, New South Wales/Australia and Tonga.

Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Pristipomoides multidens* (Day, 1871) – Gold-banded jobfish; Colas à bandes dorées

Taxonomy. First record from Réunion by Letourneur et al. (2004: 204).

Distribution. Réunion. Marine species. Found in areas of hard, rocky and uneven sea floor and steep off islands, schooling, at depths of 40–245 m. Outside the area, Red Sea and East Africa east to Samoa, north to southern Japan, south to northern Australia.
Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Rare. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Pristipomoides sieboldii* (Bleeker, 1854) – Siebold's jobfish; Vivaneau gris (Réunion), colas lavande (France)
Taxonomy. First record from Réunion by Guézé & Fourmanoir (1960: 13–14) as *P. Sieboldi*; record confirmed by Fricke (1999: 279), based on MNHN material.
Distribution. Réunion, Mauritius. Marine species. Found above rocky bottoms, at depths of 100–360 m. Outside the area, Red Sea and East Africa east to Hawaiian and Society islands, north to southern Japan, south to Arafura Sea off Northern Territory/Australia, New Caledonia and Tonga, Vema Seamount in southeastern Atlantic.
Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Pristipomoides typus* Bleeker, 1852 – Sharptooth jobfish; Vivaneau grosse écaille (Réunion), colas dentu (France)
Taxonomy. First record from Réunion by Guézé & Fourmanoir (1960: 7, 12, 20–21); western Indian Ocean records need verification.
Distribution. Réunion, Mauritius. Marine species. Found above rocky bottoms, at depths of 40–120 m. Outside the area, East Africa east to New Guinea, south to North-West Cape/Western Australia and New South Wales/Australia.
Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Pristipomoides zonatus* (Valenciennes in Cuvier & Valenciennes, 1830) – Oblique-banded snapper; Jaune de creux, jaune de large, toma, vivaneau rayé (Réunion), colas bagnard (France)
Taxonomy. First record from Réunion by Guichenot (1863: C23) as *Serranus zonatus*; record confirmed by Fricke (1999: 279–280), based on MHNRUN and MNHN material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Seychelles. Marine species. Found above rocky bottoms, at depths of 70–350 m. Outside the area, East Africa east to Hawaiian and Marquesas islands, north to southern Japan, south to off northwestern Australia, Queensland/Australia, Lord Howe Island, and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

## Caesionidae – Fusiliers

*Caesio caerulaurea* Lacepède [ex Commerson], 1801 – Scissor-tailed fusilier; Maquereau (Réunion), caesio azuror (France)
Taxonomy. First record from Réunion by Cuvier in Cuvier & Valenciennes (1830b: 434–437) as *C. caerulaureus*.
Distribution. Réunion, Mauritius. Marine species. Found in schools along seaward coral reefs, at depths of 5–50 m. Outside the area, Red Sea and East Africa east to Marshall, Tuamotu and Marquesas islands, north to southern Japan, south to off northwestern Australia, Queensland/Australia, New Caledonia and Tonga.
Conservation. Endangered in Réunion (EN). Threats: FIT, HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Caesio lunaris* Cuvier [ex Ehrenberg] in Cuvier & Valenciennes, 1830 – Blue fusilier; Caesio à croissant
Taxonomy. First record from Réunion by Carpenter (1984: 2 unnumbered pp.).
Distribution. Réunion, Mauritius, Comores, Madagascar, Aldabra, Seychelles. Marine species. Found in schools along seaward coral reefs, at depths of 0–50 m. Outside the area, Red Sea and East Africa east to Marshall Islands and Fiji, north to southern Japan, south to off northwestern Australia and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Very sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Caesio teres* Seale, 1906 – Beautiful fusilier, yellowtail fusilier; Caesio à dos jaune et bleu
Taxonomy. First record from Réunion by Chabanet (1994: 238).
Distribution. Réunion, Mauritius, Seychelles. Marine species. Found in schools in lagoons and deep channels of coral and rocky reefs, at depths of 5–50 m. Outside the area, East Africa east to Kiribati/Line Islands, Samoa and Tonga, north to Ogasawara Islands, south to off northwestern Australia and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Caesio xanthonota* Bleeker, 1853 – Yellowback fusilier; Caesio à dos jaune
Taxonomy. First record from Réunion by Letourneur (1998: 282).
Distribution. Réunion, Madagascar, Seychelles. Marine species. Found in schools in deep lagoons and seaward coral and rocky reefs, at depths of 0–50 m. Outside the area, East Africa east to Indonesia.
Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Gymnocaesio gymnoptera* (Bleeker, 1856) – Slender fusilier; Fusilier élégant
Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 93) as *G. gymnopterus*.
Distribution. Réunion, Mauritius, Madagascar. Marine species. Found in schools along seaward coral reefs, at depths of 0–150 m. Outside the area, Red Sea and East Africa east to eastern Indonesia, Philippines and Fiji, south to Loyalty Islands.
Conservation. Endangered in Réunion (EN). Threats: FIT, HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Ptercaesio marri* Schultz in Schultz, Herald, Lachner, Welander & Woods, 1953 – Marr's fusilier; Fusilier de Marr
Taxonomy. First record from Réunion by Letourneur (1998: 282).
Distribution. Réunion, Mauritius, Seychelles. Marine species. Found in schools around coral and rocky reefs, at depths of 0–50 m. Outside the area, East Africa east to Marshall and Marquesas islands, north to southern Japan and Ogasawara

Islands, south to southern Indonesia, New Guinea and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Ptercaesio tile* (Cuvier in Cuvier & Valenciennes, 1830) – Blue-streak fusilier, dark-banded fusilier; Fusilier à ligne olive
Taxonomy. First record from Réunion by Carpenter (1984: 2 unnumbered pp.).
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Aldabra, Seychelles. Marine species. Found in schools around coral and rocky reefs, at depths of 0–60 m, juveniles in lagoons and on reef flats. Outside the area, East Africa east to Kiribati/Line Islands and Pitcairn Group, north to southern Japan, south to off northwestern Australia, Queensland/Australia, New Caledonia and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

## Gerreidae – Pursemouths

*Gerres filamentosus* Cuvier [ex Russell], 1829 – Threadfin pursemouth, filamentous mojarra; Blanche fil
Taxonomy. First record from Réunion by Woodland (1984a: 2 unnumbered pp.); record confirmed by Fricke (1999: 284), based on MNHN material.
Distribution. Réunion, Mauritius, Madagascar. Freshwater, transitional water and marine. Adults on shallow soft bottoms adjacent to coral reefs, also entering lower reaches of rivers and streams, juveniles in estuaries. Outside the area, Red Sea and East Africa east to Fiji, north to southern Japan, south to Western Australia, Queensland/Australia and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: FIT, FIB, HAB, EUT, CON. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Gerres longirostris* (Lacepède, 1801) – Longtail silver-biddy; Blanche gouvernail
Taxonomy. **New record** from Réunion, based on MHNRUN and MNHN material listed by Fricke (1999: 283–284) under the name *G. acinaces*; listed as *G. acinaces* by Woodland (1984a: 2 unnumbered pp.).
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Aldabra. Freshwater, transitional water and marine. Juveniles often in estuaries or lagoons influenced by freshwater; adults prefer shallow water over sandy bottoms, down to 50 m depth, from coral reefs to brackish water. Outside the area, Red Sea, East and South Africa east to Palau/Belau and Marquesas Islands, north to Ryukyu Islands, south to Queensland/Australia, New Caledonia and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: FIT, FIB, HAB, EUT, CON. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Gerres oeyena* (Forsskål in Niebuhr, 1775) – Common silver-biddy, common mojarra; Blanche commune
Taxonomy. First record from Réunion by Guichenot (1863: C25) as *G. oyena* and *G. argyreus*; record confirmed by Fricke (1999: 284) as *G. argyreus*, based on MNHN material. Spelling of species name according to Fricke (2008: 35–36).
Distribution. Réunion, Mauritius, Comores, Madagascar. Freshwater, transitional water and marine. Found on inshore soft bottoms adjacent to coral reefs, in estuaries and lower reaches of rivers and streams. Outside the area, Red Sea, East and South Africa to Marshall Islands and Samoa, north to Ryukyu Islands, south to Western Australia, New South Wales/Australia, New Caledonia and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: FIT, FIB, HAB, EUT, CON. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

## Lobotidae – Tripletails

*Lobotes surinamensis* (Bloch, 1790) – Atlantic tripletail
Taxonomy. First record from Réunion by Letourneur et al. (2004: 204).
Distribution. Réunion. Freshwater, transitional water and marine. Adults found in bays, muddy estuaries and lower reaches of large rivers; offshore often floating near the surface in the company of floating objects, occasionally drifting over reefs; juveniles may occur in floating *Sargassum* and mimic a floating leaf. Outside the area, Mediterranean Sea, tropical and warm temperate waters of Atlantic Ocean, southwestern Indian Ocean, southern Japan, New Caledonia to Tuvalu.
Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT, CON. Sensitivity to human activities unknown. Decline unknown. Low priority for conservation action.

## Haemulidae – Rubberlips, sweetlips, grunts

*Diagramma picta* (Thunberg, 1792) – Sailfin rubberlip; Diagramme voilier
Taxonomy. First record from Réunion as *D. pictum* by Letourneur (1998: 282). The gender of the genus name is feminine, as based on γραμμή (line), not γραμμα (letter), therefore the species name must be '*picta*'.
Distribution. Réunion, Mauritius, Madagascar, Seychelles. Transitional water and marine. Found on open muddy or silty substrates in protected bays or estuaries, or in shallow coastal areas and coral or rocky reefs, juveniles are found among seagrass. Outside the area, East and South Africa east to Philippines and Fiji, north to southern Japan and Ogasawara Islands, south to southern Indonesia and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Plectorhinchus gaterinus* (Forsskål in Niebuhr, 1775) – Blackspotted sweetlips; Gueule pavée (Réunion), diagramme moucheté (France)
Taxonomy. First record from Réunion by Guichenot (1863: C25) as *Diagramma gaterina*; subsequently listed as *D. lineatus* by Fourmanoir & Guézé (1962b: 12).
Distribution. Réunion, Mauritius, Comores, Madagascar. Transitional water and marine. Found on coastal coral reefs, sand bottoms and near estuaries. Outside the area, Red Sea and East Africa, Gulf of Oman south to 30°S.
Conservation. Extinct in Réunion (RE), according to Letourneur et al. (2004: 212). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. High priority for conservation action.

*Plectorhinchus gibbosus* (Lacepède, 1802) – Harry hotlips; Diagramme noire

Taxonomy. First record from Réunion by Fricke (1999: 287–288), based on MNHN material; previously listed as *Pseudopristipoma nigrus* (non Cuvier [ex Mertens] in Cuvier & Valenciennes, 1830) by Blanc & Postel (1958: 369).

Distribution. Réunion, Mauritius, Madagascar, Seychelles. Freshwater, transitional water and marine. Found on coastal coral reefs, sand bottoms and near estuaries, entering lower reaches of rivers and streams, at depths of 0–20 m. Outside the area, East and South Africa east to Caroline and Society islands, north to Taiwan, south to Exmouth Gulf/Western Australia and Norfolk Island.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Plectorhinchus picus* (Cuvier in Guérin-Méneville, 1828) – Painted sweetlips; Perche peinte

Taxonomy. First record from Réunion by Letourneur et al. (2004: 204).

Distribution. Réunion, Mauritius, Rodrigues, Seychelles. Marine species. Found in lagoon and seaward coral reefs, adults usually under coral heads or in caves, juveniles in shallow lagoons; at depths of 3–50 m. Outside the area, east to Society Islands, north to southern Japan, south to Lord Howe Island and Rapa.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Very sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Plectorhinchus sordidus* (Klunzinger, 1870) – Black sweetlips, redlip rubberlips; Diagramme à lèvres rouges

Taxonomy. First record from Réunion by Chabanet (1994: 238).

Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Found above rocks and corals, and in seagrass areas, at depths of 1–25 m. Outside the area, Red Sea and East Africa to Transkei/South Africa.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Plectorhinchus vittatus* (Linnaeus, 1758) – Oriental sweetlips; Cabot rayé (Réunion), diagramme oriental (France)

Taxonomy. First record from Réunion by Fricke (1999: 289–290); previously listed by McKay (1984: 2 unnumbered pp.) as *P. orientalis*.

Distribution. Réunion, Mauritius, Rodrigues, Aldabra, Seychelles. Marine species. Found above coral reefs or inshore rocky coral reefs, juveniles in the lagoon. Outside the area, East Africa east to Guam and Society Islands, south to New Caledonia.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Pomadasys furcatum* (Bloch & Schneider, 1801) – Banded grunt; Coin-coin (Réunion), goret à six bandes (France)

Taxonomy. First record from Réunion by Fricke (1999: 290), based on MHNRUN and MNHN material; previously described as *Pristipoma anas* by Valenciennes (1862: 8).

Distribution. Réunion, Mauritius, Comores, Madagascar. Marine species. Found inshore, on sandy bottoms near rocks. Outside the area, South and East Africa.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action. Proposed for Annexes II and V of the EU Habitats Directive.

## S p a r i d a e – Seabreams, porgies

*Acanthopagrus bifasciatus* (Forsskål in Niebuhr, 1775) – Twobar seabream; Pagre double bande

Taxonomy. First record from Réunion by Randall (1995: 223).

Distribution. Réunion, Mauritius, Rodrigues, Madagascar. Transitional and marine water. Found in coastal waters, mainly around coral reefs; entering estuaries. Outside the area, Red Sea, Persian/Arabian Gulf and East Africa south to Natal/South Africa.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Very sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Argyrops filamentosus* (Cuvier in Cuvier & Valenciennes, 1830) – Soldier bream; Aigrette (Réunion), spare soldat (France)

Taxonomy. Original description from Réunion as *Pagrus filamentosus* by Cuvier in Cuvier & Valenciennes (1830b: 158–159).

Distribution. Réunion, Mauritius, Madagascar. Marine species. Found on sand bottoms adjacent to coral reefs, at depths of 1–40 m. Outside the area, Red Sea, East and South Africa.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Argyrops spinifer* (Forsskål in Niebuhr, 1775) – King soldierbream; Spare royal

Taxonomy. Record from Réunion by Bauchot & Smith (1984: 2 unnumbered pp); record confirmed by Fricke (1999: 292), based on MHNRUN material.

Distribution. Réunion, Mauritius, Madagascar. Marine species. Found over soft bottom, rocks and coral reefs, at depths of 1–150 m. Outside the area, Red Sea and East Africa east to Indonesia, north to South China Sea, south to northern Australia.

Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Cheimerius nufar* (Valenciennes [ex Ehenberg] in Cuvier & Valenciennes, 1830) – Santer seabream; Denté nufar

Taxonomy. Record from Réunion by Bauchot & Smith (1984: 2 unnumbered pp.).

Distribution. Réunion, Mauritius, Madagascar. Transitional water and marine. Found over rock bottom at depths of 1–100 m; juveniles in estuaries. Outside the area, Red Sea and East Africa south to Cape Province/South Africa.

Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Rhabdosargus sarba* (Forsskål in Niebuhr, 1775) – Natal stumpnose, gold-lined seabream; Gueule pavée (Réunion), sargue doré (France)

Taxonomy. Record from Réunion by Bleeker (1874: 92) as *Sparus sarba*; record confirmed by Fricke (1999: 294), based on MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Transitional water and marine. Found over various substrates, at depths of 0–60 m, often entering estuaries. Outside the area, Red Sea, East and South Africa east to

Philippines, north to southern Japan, south to northern Australia.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Rhabdosargus thorpei* Smith, 1979 – Bigeye stumpnose
Taxonomy. **New record** from Réunion, based on a specimen photographed by A. Diringer on the west coast of La Réunion.
Distribution. Réunion, Europa Island, Madagascar. Transitional water and marine. Found on coastal reefs, including estuaries. Outside the area, East and South Africa.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

## Lethrinidae – Emperors

*Gnathodentex aureolineatus* (Lacepède [ex Commerson], 1802) – Yellowspot emperor, glowfish; Petit clair (Réunion), empereur strié (France)
Taxonomy. First record from Réunion by Blanc & Postel (1958: 369); record confirmed by Fricke (1999: 295–296), based on MNHN material.
Distribution. Réunion, Mauritius, Soudan Bank, Rodrigues, Comores, Madagascar, Seychelles. Marine species. Found in lagoons, on reef flats and in seaward coral and rocky reefs, at depths of 1–30 m. Outside the area, East Africa east to Marshall Islands and Pitcairn Group, north to southern Japan, south to Point Quobba/Western Australia, eastern Australia, Norfolk Island, Tonga and Rapa.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Gymnocranius grandoculis* (Valenciennes in Cuvier & Valenciennes, 1830) – Blue-lined large-eye seabream; Capitaine (Réunion)
Taxonomy. First record from Réunion by Chabanet (1994: 239); previously described from Réunion as *Pentapus curtus* by Guichenot (1863: C5-C6, C25) and *P. dux* by Valenciennes (1862: 1203); listed by Fourmanoir & Guézé (1962b: 11) as *Gymnocranius griseus* and *G. rivulatus*, and by Letourneur et al. (2004: 204) as *G. griseus* (non Temminck & Schlegel, 1843); record confirmed by Fricke (1999: 296–297), based on MHNRUN and MNHN material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Seychelles. Marine species. Found above offshore coral reefs and rock bottom, juveniles inshore in silty areas. Outside the area, East Africa east to Marshall, Line and Marquesas islands, north to southern Japan, south to Coral Bay/Western Australia, Queensland/Australia, New Caledonia and Tonga.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Lethrinus borbonicus* Valenciennes in Cuvier & Valenciennes, 1830 – Snubnose emperor
Taxonomy. Originally described from Réunion by Valenciennes in Cuvier & Valenciennes (1830b: 303–304); subsequently listed by Bleeker (1874: 91) as *L. mahsenoides* (non Valenciennes [ex Ehrenberg] in Cuvier & Valenciennes, 1830); record confirmed by Fricke (1999: 297), based on MNHN material.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Marine species. Found during the day on sandy areas near coral reefs, at night on the reef flat. Outside the area, Red Sea and Arabian Gulf.
Conservation. Endangered in Réunion (EN). Threats: FIT, HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Lethrinus crocineus* Smith, 1959 – Yellowtail emperor; Empereur à queue jaune
Taxonomy. First record from Réunion by Fourmanoir & Guézé (1963: 10).
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Marine species. Found in coastal waters and coral reef areas. Outside the area, South and East Africa east to Sri Lanka.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Lethrinus harak* (Forsskål in Niebuhr, 1775) – Blackspot emperor, thumbprint emperor; Empereur Saint-Pierre
Taxonomy. First record from Réunion by Blanc & Postel (1958: 369); record confirmed by Fricke (1999: 298), based on MNHN material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Marine species. Found on various soft substrates associated with coral reefs. Outside the area, Red Sea and East Africa east to Marshall Islands, Samoa and Tonga, north to southern Japan, south to Timor Sea/Western Australia, New South Wales/Australia and New Caledonia.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Lethrinus mahsena* (Forsskål in Niebuhr, 1775) – Sky emperor, mahsena emperor; Capitaine (Réunion), empereur mahsena (France)
Taxonomy. First record from Réunion by Biais & Taquet (1992: 75).
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Aldabra, Seychelles. Marine species. Found above coral reefs and adjacent sand and seagrass areas. Outside the area, Red Sea and East Africa east to Sri Lanka.
Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Lethrinus microdon* Valenciennes in Cuvier & Valenciennes, 1830 – Smalltooth emperor; Gueule de vin (Réunion), empereur tidents (France)
Taxonomy. First record from Réunion by Bleeker (1874: 91) as *Gymnocranius microdon*; subsequently listed as *Lethrinus conchyliatus* (non Smith, 1959) by Biais & Taquet (1992: 75); record confirmed by Fricke (1999: 299–300), based on MHNRUN material.
Distribution. Réunion, Mauritius, Madagascar, Seychelles, Cargados Carajos. Marine species. Found above sandy areas near coral reefs, at depths of 1–80 m. Outside the area, Red Sea and East Africa east to New Guinea, north to southern Japan, south to northwestern Australia.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Lethrinus nebulosus* (Forsskål in Niebuhr, 1775) – Spangled emperor; Capitaine blanc (Réunion), empereur moris (France)
Taxonomy. First record from Réunion by Fourmanoir & Guézé (1963: 10); record confirmed by Fricke (1999: 300), based on MHNRUN material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles, Cargados Carajos. Marine species. Found in coral reefs, lagoons, seagrass beds and coastal sand and rock areas, juveniles also in tidal pools; at depths of 0–75 m. Outside the area, Red Sea, East and South Africa east to Samoa, north to southern Japan and Ogasawara Islands, south to New South Wales/Australia and Lord Howe Island.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Lethrinus rubrioperculatus* Sato 1978 – Spotcheek emperor, redgill emperor; Béquine (Réunion), empereur honteux (France)
Taxonomy. First record from Réunion by Biais & Taquet (1992: 75).
Distribution. Réunion, Mauritius, Soudan Bank, Aldabra, Seychelles. Marine species. Found above sand and rubble areas on outer coral reef slopes, at depths of 10–198 m. Outside the area, East Africa east to Wake, Marshall and Marquesas islands, north to southern Japan, south to Exmouth Gulf/Western Australia, New Caledonia and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Lethrinus variegatus* Valenciennes [ex Ehrenberg] in Cuvier & Valenciennes, 1830 – Variegated emperor; Kaya, baxou (Réunion), empereur bas cou (France)
Taxonomy. First record from Réunion by Blanc & Postel (1958: 369).
Distribution. Réunion, Mauritius, Comores, Madagascar, Aldabra, Seychelles. Marine species. Found in sand and seagrass areas near coral reefs, at depths of 0–40 m. Outside the area, Malaysia and Indonesia east to Palau/Belau and Tonga, north to Ryukyu Islands, south to Exmouth Gulf/Western Australia and Queensland/Australia.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Lethrinus xanthochilus* Klunzinger, 1870 – Yellowlip emperor; Empereur bec de cane
Taxonomy. First record from Réunion by Fourmanoir & Guézé (1963: 10) as *L. xanthocheilus*.
Distribution. Réunion, Mauritius, Comores, Madagascar, Aldabra, Seychelles. Marine species. Found in sand and seagrass areas near coral reefs, at depths of 0–150 m. Outside the area, Red Sea and East Africa east to Marshall, Marquesas and Gambier islands, north to Ryukyu Islands, south to Rowley Shoals/Western Australia, New Caledonia and Tonga.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Monotaxis grandoculis* (Forsskål in Niebuhr, 1775) – Bigeye emperor, bigeye barenose; Gueule pavée (Réunion), empereur bossu (France)
Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 93).
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles. Marine species. Found on sand and rubble areas near coral and rocky reefs, at depths of 1–60 m. Outside the area, Red Sea and East Africa east to Hawaiian and Line islands and Pitcairn Group, north to southern Japan, south to Exmouth Gulf/Western Australia and Queensland/Australia, New Caledonia, Tonga, Austral and Gambier islands.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

### N e m i p t e r i d a e – Butterfly breams, spinecheeks

*Scolopsis frenatus* (Cuvier in Cuvier & Valenciennes, 1830) – Bridled spinecheek; Mamile de Seychelles
Taxonomy. First record from Réunion by Fricke (1999: 303–304), based on MHNRUN material; previously listed as *Scolopsides phoeops* by Sauvage (1891: 176–177).
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles, Cargados Carajos. Marine species. Found on sand bottoms adjacent to coral reefs, at depths of 1–20 m. Outside the area, East Africa east to Chagos Archipelago.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Very sensitive to human activities. Probable decline. Medium priority for conservation action.

### S c i a e n i d a e – Drums and croakers

*Sciaenops ocellatus* (Linné, 1766) – Red drum; Tambour rouge
Taxonomy. First record from Réunion by Letourneur et al. (2004: 204).
Distribution. Réunion. Transitional water and marine. Found over sand and sandy mud bottoms in coastal waters and estuaries, at depths of 0–20 m. Introduced for aquaculture, escaped into natural environment (Letourneur et al. 2004: 204); not native of Réunion. Outside the area, originally western Atlantic, from Massachusetts/USA to northern Mexico.
Conservation. Not evaluated in Réunion (NE). Not native of Réunion. No conservation action in favour of this species advisable.

*Umbrina canariensis* Valenciennes in Cuvier & Valenciennes, 1843 – Canary drum; Ombrine bronze
Taxonomy. First record from Réunion by Fricke (1999: 304), based on MNHN material.
Distribution. Réunion. Marine species. Found on sand or mud bottoms on the insular shelf or upper slope. Outside the area, eastern Atlantic from Morocco south to Cape of Good Hope/South Africa, western Indian Ocean from South Africa to Pakistan.
Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitivity to human activities unknown. Decline unknown. Low priority for conservation action.

### P o l y n e m i d a e – Threadfins

*Leptomelanosoma indicum* (Shaw, 1804) – Indian threadfin; Barbure indien
Taxonomy. First record from Réunion by Menon & Babu Rao (1984: 2 unnumbered pp.).
Distribution. Réunion, Mauritius, Madagascar. Freshwater, transitional water and marine. Found on inshore mud and

sand bottoms including tidal pools, estuaries and lower reaches of rivers and streams. Outside the area, Pakistan east to New Guinea, possibly also East Africa.
Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Sensitive to human activities. Decline unknown. Low priority for conservation action.

*Polydactylus plebeius* (Broussonet, 1782) – Striped threadfin; Barbé, barbue (Réunion), barbure rayé (France)
Taxonomy. First record from Réunion by Guichenot (1863: C24) as *Polynemus plebeius*; record confirmed by Fricke (1999: 305–306), based on MHNRUN, MNHN and SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar. Transitional water and marine. Found on mud bottoms from estuaries down to 122 m depth. Outside the area, South and East Africa east to Philippines, Society and Marquesas islands, north to southern Japan, south to Western Australia, Port Stephens/New South Wales and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Sensitive to human activities. Decline unknown. Low priority for conservation action.

## Mullidae – Goatfishes

*Mulloidichthys auriflamma* (Forsskål in Niebuhr, 1775) – Indian Ocean yellowfin goatfish, Indian Ocean flame goatfish; Capucin queue jaune
Taxonomy. Taxonomic decision of the present paper (due to fewer gill rakers than Pacific *Mulloidichthys vanicolensis*, and different juvenile colour pattern), and **new record** from Réunion, based on MNHN, SMNS and USNM material listed by Fricke (1999: 309) as *Mulloidichthys vanicolensis*; previously listed as *Mulloides vanicolensis* (non Valenciennes in Cuvier & Valenciennes, 1831) by Kumaran & Randall (1984: 2 unnumbered pp.).
Distribution. Réunion, Mauritius, Comores. Marine species. Found over reef flats and sand adjacent to coral or rocky reefs, at depths of 0–110 m. Outside the area, Red Sea, East Africa east to western Indonesia.
Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Mulloidichthys flavolineatus* (Lacepède [ex Commerson], 1801) – Yellowstripe goatfish; Capucin (Réunion), capuciva à bande jaune (France)
Taxonomy. First record from Réunion by Cuvier in Cuvier & Valenciennes (1829a: 456–459) as *Upeneus flavolineatus*; subsequently listed as *Mulloidichthys auriflamma* (non Forsskål in Niebuhr, 1775) by Blanc & Postel (1958: 369, 373); record confirmed by Fricke (1999: 307–309), based on LEMUR, MHNRUN, MNHN, SMNS and USNM material.
Distribution. Réunion, Mauritius, Rodrigues, Europa Island, Madagascar, Cargados Carajos. Marine species. Found over sand adjacent to coral or rocky reefs, at depths of 1–35 m. Outside the area, Red Sea, East and South Africa east to Hawaiian and Line islands and Pitcairn Group, north to southern Japan, south to Joseph Bonaparte Gulf/Western Australia, New South Wales/Australia at 36°S, Lord Howe Island and Rapa.
Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Mulloidichthys pfluegeri* (Steindachner, 1900) – Orange goatfish; Capuciva orange
Taxonomy. First record from Réunion by Myers (1989: 148) as *Mulloides pfluegeri*; record confirmed by Fricke (1999: 309), based on MNHN material.
Distribution. Réunion, Rodrigues. Marine species. Found over sand and limestone adjacent to coral reefs, at depths of 30–110 m. Outside the area, eastern Indonesia east to Hawaiian and Marquesas islands, north to Ryukyu Islands, south to Tonga.
Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Parupeneus barberinus* (Lacepède [ex Commerson], 1801) – Dash-and-dot goatfish; Capucin sergent (Réunion), rouget-barbet barberin (France)
Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 94) as *Parupaeneus barberinus*; record confirmed by Fricke (1999: 310–311), based on LEMUR, MNHN and SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Found over sand and rubble adjacent to coral or rocky reefs, at depths of 1–100 m. Outside the area, South and East Africa east to Line, Marquesas and Gambier islands, north to southern Japan, south to Western Australia, New South Wales/Australia, Lord Howe Island and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Parupeneus ciliatus* (Lacepède [ex Commerson], 1802) – Whitesaddle goatfish
Taxonomy. First record from Réunion by Fricke (1999: 313), based on MNHN and SMNS material; previously listed as *Upeneus chryseredros* by Cuvier in Cuvier & Valenciennes (1829a: 470–472, part), and as *U. cyprinoides* by Guichenot (1863: C24).
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Found in seagrass beds, lagoons, and seaward coral reefs, at depths of 1–91 m. Outside the area, East Africa east to Marshall Islands and Pitcairn, north to southern Japan, south to Joseph Bonaparte Gulf/Western Australia, New South Wales/Australia, Lord Howe Island, Tonga and Rapa.
Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Parupeneus cyclostomus* (Lacepède [ex Commerson], 1801) – Yellowsaddle goatfish; Capucin malbar (Réunion), rouget-barbet doré (France)
Taxonomy. First record from Réunion by Kumaran & Randall (1984: 2 unnumbered pp.); previously listed as *P. chryseredros* by Bleeker (1874: 80); record of *P. cyclostomus* confirmed by Fricke (1999: 313–314), based on LEMUR, MHNRUN and MNHN material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Found on coral, rocky, or rubble bottoms of reef flats, lagoons, and seaward reefs, at depths of 1–100 m. Outside the area, Red Sea, East and South Africa east to Hawaiian and Line islands and Pitcairn Group, north to southern Japan, south to Point Quobba/Western Australia, New South Wales/Australia and Rapa.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

**Parupeneus diagonalis* Randall, 2004 – Diagonal goatfish; Rouget-barbet diagonal
Taxonomy. Original description from Réunion by RANDALL (2004: 25, fig. 5, pl. IV B).
Distribution. Réunion. Marine species. Found on soft bottoms close to coral reefs. Endemic to Réunion.
Conservation. Near threatened in Réunion (NT). Threats: FIB, HAB, EUT. Global importance. Rare. Sensitive to human activities. Decline unknown. High priority for conservation action.

*Parupeneus heptacanthus* (Lacepède, 1802) – Redspot goatfish, cinnabar goatfish; Rouget-barbet cinnabare
Taxonomy. First record from Réunion by FRICKE (1999: 315); previously listed as *P. cinnabarinus* by KUMARAN & RANDALL (1984: 2 unnumbered pp.).
Distribution. Réunion, Mauritius, Rodrigues, Madagascar. Marine species. Found over muddy, sandy, rubble, or seagrass bottoms of lagoon and seaward coral reefs, at depths of 12–100 m. Outside the area, Red Sea and East Africa east to Marshall Islands, Samoa and Tonga, north to southern Japan, south to Western Australia and Lord Howe Island.
Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Parupeneus indicus* (Shaw [ex Russell], 1803) – Indian goatfish; Rouget-barbet indien
Taxonomy. First record from Réunion by BLEEKER (1874: 80); record confirmed by FRICKE (1999: 315), based on MNHN material.
Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Found on sandy or silty areas of coastal and inner lagoon coral or rocky reefs, at depths of 0–20 m. Outside the area, South and East Africa east to Marshall and Austral islands, north to southern Japan and Ogasawara Islands, south to Joseph Bonaparte Gulf/Western Australia, Queensland/Australia and Tonga.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Parupeneus macronemus* (Lacepède [ex Commerson], 1801) – Longbarbel goatfish, band-dot goatfish; Rouget-barbet bandeau
Taxonomy. First record from Réunion by BLEEKER (1874: 80) as *P. macronema*; previously listed as *Upeneus lateristriga* by GUICHENOT (1863: C24); record confirmed by FRICKE (1999: 315–317), based on LEMUR and MNHN material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles. Marine species. Found on sand bottoms adjacent to coral or rocky reefs, at depths of 0–25 m. Outside the area, Red Sea, East and South Africa east to Philippines and New Guinea.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Parupeneus pleurostigma* (Bennett, 1831) – Blackspot goatfish, sidespot goatfish; Rouget-barbet pastille
Taxonomy. First record from Réunion by KUMARAN & RANDALL (1984: 2 unnumbered pp.); record confirmed by FRICKE (1999: 317), based on BPBM and MNHN material.
Distribution. Réunion, Mauritius, Soudan Bank, Rodrigues, Madagascar, Seychelles. Marine species. Found on various substrates associated with coral or rocky reefs, at depths of 1–46 m. Outside the area, East Africa, Andaman Sea east to Hawaiian and Line islands and Pitcairn Group, north to southern Japan, south to Point Quobba/Western Australia, New South Wales/Australia, Lord Howe Island, Tonga and Rapa.
Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

**Parupeneus posteli* Fourmanoir & Guézé, 1967 – Postel's goatfish; Rouget-barbet de Postel
Taxonomy. Originally described from Réunion by FOURMANOIR & GUÉZÉ (1967: 47–49).
Distribution. Réunion. Marine species. Found on soft bottoms close to reefs, at depths of 150–250 m. Endemic to Réunion.
Conservation. Near threatened in Réunion (NT). Threats: FIB, EUT. Global importance. Rare. Sensitive to human activities. Keystone species. Decline unknown. High priority for conservation action.

*Parupeneus rubescens* (Lacepède [ex Commerson], 1801) – Blacksaddle goatfish, rosy goatfish; Rouget-barbet sellé
Taxonomy. First record from Réunion by MAUGÉ & GUÉZÉ (1984: 498–502) as *Mullus rubescens*; record confirmed by FRICKE (1999: 318), based on MNHN material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Marine species. Found on sand bottoms near coral or rocky reefs, at depths of 1–100 m. Outside the area, Red Sea, East Africa and Mossel Bay/South Africa east to Philippines, north to southern Japan, south to northern Australia.
Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Parupeneus trifasciatus* (Lacepède [ex Commerson], 1801) – Two-barred goatfish; Capucin (Réunion), rouget-barbet double-tache (France)
Taxonomy. First record from Réunion by MAUGÉ & GUÉZÉ (1984: 491) as *Mullus trifasciatus*; previously listed by CUVIER in CUVIER & VALENCIENNES (1829a: 468–470) as *M. bifasciatus*; record confirmed by FRICKE (1999: 311–312) as *Parupeneus bifasciatus*, but with discussion that *P. trifasciatus* would be the valid name due to selection by GÜNTHER (1859: 407–408) who acted as the first reviser; based on LEMUR, MHNRUN, MNHN and SMNS material. Taxonomic decision based here on prevailing usage.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Juveniles are found on the reef flat, adults around steep slopes of coral or rocky reefs at depths of 1–80 m. Outside the area, South and East Africa east to western Indonesia.
Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

**Upeneus mascareinsis* Fourmanoir & Guézé, 1967 – Mascarene goatfish; Rouget-barbet des Mascareines
Taxonomy. Originally described from Réunion by FOURMANOIR & GUÉZÉ (1967: 50–51). Also MHNRUN material (DURVILLE et al. submitted).
Distribution. Réunion. Marine species. Found on sand bottoms. Endemic to Réunion.
Conservation. Near threatened in Réunion (NT). Threats: FIB,

HAB, EUT. Global importance. Rare. Sensitive to human activities. Probable decline. High priority for conservation action.

*Upeneus sulphureus* Cuvier in Cuvier & Valenciennes, 1829 – Sunrise goatfish; Rouget souris aurore
Taxonomy. First record from Réunion by Sauvage (1891: 217–218) as *Upeneoides sulphureus*.
Distribution. Réunion, Mauritius, Madagascar, Seychelles. Transitional water and marine. Found on inshore soft bottoms at depths of 0–90 m, enters estuaries. Outside the area, southern Red Sea and East Africa east to Philippines and Fiji, north to southern Japan, south to Joseph Bonaparte Gulf/Western Australia and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: FIB, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Upeneus vittatus* (Forsskål in Niebuhr, 1775) – Yellow-banded goatfish, striped goatfish; Rouget souris orangé
Taxonomy. First record from Réunion by Guichenot (1863: C24); subsequently listed as *U. tragula* (non Richardson, 1846) by Letourneur (1992: 53); record of *U. vittatus* confirmed by Fricke (1999: 319–320), based on MNHN material.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Freshwater, transitional water and marine. Found on inshore soft bottoms at depths of 0–90 m, enters estuaries. Outside the area, Red Sea, East and South Africa east to Marshall, Line and Marquesas islands, north to southern Japan, south to Shark Bay/Western Australia, New Caledonia and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

## Pempheridae – Sweepers

*Parapriacanthus ransonneti* Steindachner, 1870 – Slender sweeper, pygmy sweeper
Taxonomy. First record from Réunion by Fricke (1999: 320).
Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Found in large schools under overhanging corals and in caves of the coral reef, at depths of 0.5–72 m. Outside the area, Red Sea, East and South Africa east to Marshall Islands and Fiji, north to southern Japan, south to Western Australia and Lord Howe Island.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Pempheris adusta* Bleeker, 1877 – Dusky sweeper
Taxonomy. First record from Réunion by Letourneur (1992: 84).
Distribution. Réunion, Madagascar. Marine species. Found in large schools under overhanging corals and in caves of coral or rocky reefs, at depths of 1–20 m. Outside the area, Transkei/South Africa and East Africa east to New Guinea.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Pempheris mangula* Cuvier [ex Russell], 1829 – Black-edged sweeper
Taxonomy. First record from Réunion by Letourneur (1992: 54, 84).
Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles. Marine species. Found in large schools under overhanging corals and in caves of the coral reef, at depths of 1–20 m. Outside the area, Red Sea and East Africa east to Samoa, south to New South Wales/Australia.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Pempheris nesogallica* Cuvier in Cuvier & Valenciennes, 1831 – Mauritius sweeper
Taxonomy. **New record** from Réunion, based on a specimen collected during a visual census, on the outer and inner coral reef, in 2004 (P. Durville, E. Tessier, T. Mulochau). Reported by authors as *Pempheris vanicolensis* (non Cuvier in Cuvier & Valenciennes, 1831). Taxonomic decision of Heemstra & Heemstra (2004: 327).
Distribution. Réunion, Mauritius. Marine species. Found in coral reefs, at depths of 0–10 m. Endemic to the western Mascarenes.
Conservation. Vulnerable in Réunion (VU). Threats: FIT, FIB, EUT. Regional importance. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Pempheris oualensis* Cuvier in Cuvier & Valenciennes, 1831 – Bronze sweeper
Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 94); record confirmed by Fricke (1999: 321), based on SMNS material.
Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Found in large schools under overhanging corals and in caves of lagoon and seaward coral reefs, at depths of 1–36 m. Outside the area, Red Sea, East and South Africa to Line and Marquesas islands, north to Ryukyu Islands, south to Rottnest Island/Western Australia, Lord Howe Island and Rapa.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Pempheris schwenkii* Bleeker, 1855 – Blackstripe sweeper
Taxonomy. **New record** from Réunion, based on a specimen collected during a visual census, on the outer and inner coral reef, in 2004 (P. Durville, E. Tessier, T. Mulochau).
Distribution. Réunion, Madagascar, Cargados Carajos. Fresh water, transitional water and marine. Found in coral and rocky reefs, hiding in caves during the day; also entering estuaries and freshwater streams; at depths of 0–40 m. Outside the area, Red Sea and East Africa east to Tonga, north to Penghu Islands.
Conservation. Data deficient in Réunion (DD). Threats: FIT, FIB, EUT. Sensitive to human activities. Probable decline. Low priority for conservation action.

## Kyphosidae – Sea chubs

*Kyphosus bigibbus* Lacepède [ex Commerson], 1801 – Grey chub, brown chub
Taxonomy. First record from Réunion by Fricke (1999: 322–323), based on MHNRUN material; previously listed as *Pimelepterus fuscus* by Bleeker (1874: 94).
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Marine species. Found in shallow water around exposed seaward coral reefs. Outside the area, Red Sea, East Africa and Cape of Good Hope/South Africa east to western Indonesia.
Conservation. Data deficient in Réunion (DD). Threats: FIT,

HAB, EUT. Very sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Kyphosus cinerascens* (Forsskål in Niebuhr, 1775) – Blue seachub, lowfin rudderfish

Taxonomy. First record from Réunion by HARMELIN-VIVIEN (1976: 92); previously described as *Pimelepterus altipinnis* by CUVIER in CUVIER & VALENCIENNES (1831: 270–273), and by GUICHENOT (1863: C7–C8) as *P. altipinnoides*; record confirmed by FRICKE (1999: 323–324), based on MNHN material. Taxonomic decision of and neotype designation for *Sciaena cinerascens* Forsskål by SAKAI & NAKABO (2006: 338–348); see also FRICKE (2008: 44).

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra. Marine species. Found over hard bottoms covered with algae, on exposed reef flats and seaward coral reefs, at depths of 0–24 m. Outside the area, Red Sea and East Africa east to Hawaiian, Line and Easter islands, north to southern Japan, south to Western Australia, Lord Howe and Austral islands.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Kyphosus vaigiensis* (Quoy & Gaimard, 1825) – Brassy chub

Taxonomy. First record from Réunion by HARMELIN-VIVIEN (1976: 94); record confirmed by FRICKE (1999: 324), based on MHNRUN material.

Distribution. Réunion, Madagascar. Marine species. Found over hard bottoms covered with algae, on exposed reef flats and seaward coral and rocky reefs, at depths of 0–24 m. Outside the area, Red Sea, East and South Africa to Hawaiian, Line and Marquesas islands, north to central Japan, south to Western Australia, New South Wales/Australia, northern New Zealand, Tonga and Rapa.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

## Drepanidae – Sicklefishes

*Drepane punctata* (Linnaeus, 1758) – Spotted sicklefish

Taxonomy. First record from Réunion by MAUGÉ (1984b: 2 unnumbered pp.); record confirmed by LETOURNEUR et al. (2004: 212).

Distribution. Réunion. Transitional water and marine. Found in various inshore habitats: sand or mud bottoms, reefs, estuaries and harbours, at depths of 1–49 m. Outside the area, east to Philippines, north to southern Japan.

Conservation. Extinct in Réunion (RE), according to LETOURNEUR et al. (2004: 212). Threats: FIT, FIB. Sensitive to human activities. High priority for conservation action.

## Monodactylidae – Moonies

*Monodactylus argenteus* (Linnaeus, 1758) – Silver moony, mono, Natal moony; Poisson lune argenté

Taxonomy. First record from Réunion by BLEEKER (1874: 94); previously listed as *Psettus rhombeus* by GUICHENOT (1863: C26); record confirmed by FRICKE (1999: 324–325), based on MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Freshwater, transitional water and marine. Found in bays, estuaries, tidal creeks, and lower reaches of freshwater streams, occasionally in silty coastal reefs. Outside the area, Red Sea, East and South Africa east to Caroline and Mariana islands and Samoa, north to Ryukyu Islands, south to Port Hedland/Western Australia, Australian Capital Territory at Jervis Bay/Australia and New Caledonia.

Conservation. Least concern in Réunion (LC). Threats: FIB, CON. Sensitive to human activities. Keystone species. Stable populations. Medium priority for conservation action.

*Monodactylus falciformis* Lacepède [ex Commerson], 1801 – Cape moony, full moony; Lune pleine

Taxonomy. First record from Réunion by PLAYFAIR & GÜNTHER (1867: IX); previously listed as *Psettus Commersonii* by GUICHENOT (1863: C26).

Distribution. Réunion, Mauritius, Madagascar, Seychelles. Freshwater, transitional water and marine. Found in bays, estuaries, tidal creeks, and lower reaches of freshwater streams, occasionally in silty coastal reefs. Outside the area, Red Sea and East Africa south to Cape Province/South Africa.

Conservation. Data deficient in Réunion (DD). Threats: FIB, CON. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

## Chaetodontidae – Butterflyfishes

*Chaetodon auriga* Forsskål in Niebuhr, 1775 – Threadfin butterflyfish

Taxonomy. First record from Réunion by BLEEKER (1874: 95) as *Tetragonoptrus auriga*; record confirmed by FRICKE (1999: 326–327), based on LEMUR, MHNRUN, MNHN and SMNS material.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Aldabra, Seychelles. Marine species. Found in live and dead coral reef and lagoon habitats, also on rocky reefs, at depths of 0–35 m. Outside the area, Red Sea, East and South Africa east to Hawaiian and northern Line islands and Pitcairn Group, north to southern Japan, south to Western Australia, New South Wales/Australia, Lord Howe and Kermadec islands, and Rapa.

Conservation. Vulnerable in Réunion (VU). Threats: FIB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Chaetodon blackburnii* Desjardins in Liénard, 1836 – Blackburn's butterflyfish, brownburnie

Taxonomy. First record from Réunion by HARMELIN-VIVIEN (1976: 94) as *C. blackburni*; record confirmed by FRICKE (1999: 327–328), based on BPBM and MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar. Marine species. Found on outer coral reef slopes with moderate coral growth, also on rocky reefs, at depths of 5–30 m. Outside the area, East and South Africa (Kenya to 33°S).

Conservation. Vulnerable in Réunion (VU). Threats: HAB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Chaetodon dolosus* Ahl, 1923 – African butterflyfish, black-edged butterflyfish; Chétodon à demi-deuil

Taxonomy. First record from Réunion by LETOURNEUR (1998: 282); record confirmed by FRICKE (1999: 328), based on MNHN material. Also MHNRUN material.

Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Found on deep offshore reefs over rocks and

coral rubble, at depths of 40–200 m. Outside the area, East Africa from Somalia south to Natal/South Africa.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Chaetodon guttatissimus* Bennett, 1833 – Peppered butterflyfish, spotted butterflyfish, gorgeous gussy; Chétodon moucheté
Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 94); record confirmed by Fricke (1999: 329–330), based on BPBM and MNHN material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Found between live *Acropora* corals in lagoon and seaward reefs, at depths of 1–25 m. Outside the area, Red Sea, East Africa and Durban/South Africa east to Christmas Island (eastern Indian Ocean), Sri Lanka and Andaman Sea coast of Thailand.
Conservation. Critically endangered in Réunion (CR). Threats: PRL, HAB, EUT. Very sensitive to human activities. Severe decline. High priority for conservation action. Proposed for Annexes II and IV of the EU Habitats Directive.

*Chaetodon interruptus* Ahl, 1923 – Teardrop butterflyfish, limespot butterflyfish; Chétodon à tache de citron
Taxonomy. First record from Réunion by Fricke (1999: 337–338), based on BPBM and MNHN material; previously listed as *C. unimaculatus* (non Bloch, 1787) by Harmelin-Vivien (1976: 95).
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Marine species. Found from coral reef flats down to deep slopes. Outside the area, South and East Africa east to western Indonesia.
Conservation. Vulnerable in Réunion (VU). Threats: HAB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Chaetodon kleinii* Bloch, 1790 – Klein's butterflyfish, white-spotted butterflyfish; Papillon (Réunion)
Taxonomy. First record from Réunion by Bleeker (1874: 95) as *Tetragonoptrus Kleini*; record confirmed by Fricke (1999: 330–331), based on LEMUR and MNHN material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Marine species. Found in lagoon and seaward coral and rocky reefs, at depths of 2–61 m. Outside the area, Red Sea, East and South Africa east to Hawaiian, Line and Marquesas islands, north to southern Japan, south to Kimberleys/Western Australia, Lord Howe Island and Tonga.
Conservation. Vulnerable in Réunion (VU). Threats: HAB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Chaetodon lineolatus* Cuvier [ex Quoy & Gaimard] in Cuvier & Valenciennes, 1831 – Lined butterflyfish; Chétodon linéolé
Taxonomy. First record from Réunion by Letourneur (1992, unpag. 4); record confirmed by Letourneur et al. (2004: 204).
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles, Cargados Carajos. Marine species. Found in lagoon and seaward coral reefs, at depths of 0–5 m. Outside the area, Red Sea and East Africa east to Hawaiian, Line and Marquesas islands, north to southern Japan, south to Western Australia, Lord Howe and Gambier islands.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Chaetodon lunula* (Lacepède [ex Commerson], 1802) – Racoon butterflyfish, halfmoon butterflyfish; Chétodon à croissant
Taxonomy. First record from Réunion by Guichenot (1863: C25, C26) as *C. lunula*, *C. biocellatus* and *C. maculatus*; subsequently listed as *Tetragonoptrus fasciatus* (non Forsskål in Niebuhr, 1775) by Bleeker (1874: 95); record confirmed by Fricke (1999: 332–333), based on LEMUR, MHNRUN, MNHN, SMNS and USNM material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Found on reef flats in lagoon and seaward coral and rocky reefs, including tidal pools, at depths of 0–30 m. Outside the area, East Africa east to Hawaiian and Line islands and Pitcairn Group, north to southern Japan, south to Western Australia, New South Wales/Australia, Lord Howe Island and Rapa.
Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Chaetodon madagaskariensis* Ahl, 1923 – Pearly butterflyfish; Chétodon de Madagascar
Taxonomy. First record from Réunion by Letourneur (1992, unpag. 4); previously listed as *C. chrysurus* (non Bloch & Schneider, 1801) by Harmelin-Vivien (1976: 94); record confirmed by Fricke (1999: 333–334), based on LEMUR and MNHN material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Marine species. Found on outer seaward coral and rocky reef habitats, at depths of 10–40 m. Outside the area, South and East Africa east to Cocos-Keeling and Christmas islands (eastern Indian Ocean), north to Sri Lanka.
Conservation. Vulnerable in Réunion (VU). Threats: HAB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Chaetodon melannotus* Bloch & Schneider, 1801 – Black-backed butterflyfish; Chétodon à dos noir
Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 95) as *C. melanotus*; record confirmed by Fricke (1999: 334), based on LEMUR and SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles, Cargados Carajos. Marine species. Found in coral-rich areas of reef flats, lagoon and seaward reefs, at depths of 0–20 m. Outside the area, Red Sea and East Africa east to Marshall Islands and Tonga, north to southern Japan, south to Kimberleys/Western Australia and New South Wales/Australia.
Conservation. Critically endangered in Réunion (CR). Threats: HAB, EUT. Very sensitive to human activities. Severe decline. High priority for conservation action. Proposed for Annexes II and IV of the EU Habitats Directive.

*Chaetodon meyeri* Schneider [ex Renard] in Bloch & Schneider, 1801 – Meyer's butterflyfish, scrawled butterflyfish
Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 95).
Distribution. Réunion. Marine species. Found in coral-rich areas of lagoon and seaward reefs, at depths of 2–25 m. Outside the area, East Africa east to Caroline, Line and Phoenix islands, north to Ryukyu Islands, south to Queensland/Australia, New Caledonia and Tonga.
Conservation. Critically endangered in Réunion (CR). Threats:

PRL, HAB, EUT. Very sensitive to human activities. Severe decline. High priority for conservation action.

*Chaetodon mitratus* Günther, 1860 – Indian butterflyfish
Taxonomy. First record from Réunion by ALLEN (1979: 206–207); record confirmed by FRICKE (1999: 335), based on MNHN material.
Distribution. Réunion, Mauritius, Amirantes, Cosmoledo. Marine species. Found on steep outer reef drop-offs in rubble areas or among groups of black corals and sea fans, at depths of 30–70 m. Outside the area, Chagos, Maldives, Cocos-Keeling and Christmas islands (eastern Indian Ocean).
Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Chaetodon trifascialis* Quoy & Gaimard, 1825 – Chevroned butterflyfish, rightangle butterflyfish
Taxonomy. First record from Réunion by HARMELIN-VIVIEN (1976: 95); record confirmed by FRICKE (1999: 336), based on LEMUR and SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Found in shallow lagoon and semi-protected seaward coral reefs, at depths of 0–30 m; associated with *Acropora* corals. Outside the area, Red Sea, East and South Africa east to northern Line and Tuamotu islands, north to southern Japan, south to Exmouth Gulf/Western Australia, New South Wales/Australia, Lord Howe Island and Rapa.
Conservation. Endangered in Réunion (EN). Threats: PRL, HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action. Proposed for Annexes II and IV of the EU Habitats Directive.

*Chaetodon trifasciatus* Park, 1797 – Redfin butterflyfish, purple butterflyfish, melon butterflyfish
Taxonomy. First record from Réunion by HARMELIN-VIVIEN (1976: 95); previously listed as *Tetragonoptrus vittatus* by BLEEKER (1874: 95); record confirmed by FRICKE (1999: 336–337), based on LEMUR and SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles. Marine species. Found in coral-rich lagoons and semi-protected seaward coral reefs, at depths of 0–20 m. Outside the area, South and East Africa east to Sumatera and Java (Indonesia). The species is replaced in the western Pacific by *Chaetodon lunulatus* Quoy & Gaimard, 1825.
Conservation. Critically endangered in Réunion (CR). Threats: PRL, HAB, EUT. Very sensitive to human activities. Severe decline. High priority for conservation action.

*Chaetodon vagabundus* Linnaeus, 1758 – Vagabond butterflyfish; Chétodon à vagabond
Taxonomy. First record from Réunion by GUICHENOT (1863: C25) as *C. vagabundus* and *C. mesogallicus*; record confirmed by FRICKE (1999: 338–339), based on LEMUR, MNHN and SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Aldabra, Seychelles. Transitional water and marine. Found on coral and rocky reefs, including areas with freshwater runoff, at depths of 0–30 m. Outside the area, Red Sea and East Africa east to Marshall, northern Line and Tuamotu islands, north to southern Japan, south to Kimberleys/Western Australia, Lord Howe and Austral islands.
Conservation. Vulnerable in Réunion (VU). Threats: FIB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Chaetodon xanthocephalus* Bennett, 1833 – Yellowhead butterflyfish; Chétodon à tête jaune
Taxonomy. First record from Réunion by HARMELIN-VIVIEN (1976: 95); *C. nigripinnatus* Liénard [ex Desjardins], 1836 (LIÉNARD 1836: 57, holotype: NHMI uncat., dry specimen) is a junior synonym; record of *C. xanthocephalus* confirmed by FRICKE (1999: 340), based on MHNRUN material.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Aldabra, Seychelles. Marine species. Found around isolated coral heads, occasionally also on rocky reefs, at depths of 0–30 m. Outside the area, East Africa (Somalia to 30°S) east to Chagos Archipelago and Sri Lanka.
Conservation. Vulnerable in Réunion (VU). Threats: HAB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Chaetodon zanzibarensis* Playfair in Playfair & Günther, 1867 – Zanzibar butterflyfish; Chétodon de Zanzibar
Taxonomy. First record from Réunion by FRICKE (1999: 340), based on an underwater observation in 1995.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles, Cargados Carajos. Marine species. Found associated with *Acropora* or *Goniopora* thickets in coral reefs, at depths of 0–40 m. Outside the area, East Africa (Somalia to 30°S) east to Chagos Archipelago.
Conservation. Critically endangered in Réunion (CR). Threats: PRL, HAB, EUT. Rare. Very sensitive to human activities. Severe decline. High priority for conservation action.

*Forcipiger flavissimus* Jordan & McGregor in Jordan & Evermann, 1898 – Long-nosed butterflyfish; Papillon longnez
Taxonomy. First record from Réunion by CHABANET (1994: 239); record confirmed by FRICKE (1999: 341), based on USNM material.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Marine species. Found in lagoon and exposed seaward coral reefs, occasionally also on rocky reefs, at depths of 1–80 m. Outside the area, Red Sea and East Africa east to tropical eastern Pacific, north to southern Japan, south to Western Australia, New South Wales/Australia, Lord Howe and Kermadec islands, and Rapa.
Conservation. Vulnerable in Réunion (VU). Threats: HAB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Forcipiger longirostris* (Broussonet, 1782)
Taxonomy. First record from Réunion by FOURMANOIR & GUÉZÉ (1963: 14).
Distribution. Réunion, Mauritius, Comores. Marine species. Found on seaward coral reefs, at depths of 3–70 m. Outside the area, East Africa east to Hawaiian Islands and Pitcairn Group, north to Ogasawara Islands, south to Western Australia, Queensland/Australia, and Tonga.
Conservation. Critically endangered in Réunion (CR). Threats: PRL, HAB, EUT. Rare. Very sensitive to human activities. Severe decline. High priority for conservation action.

*Hemitaurichthys zoster* (Bennett, 1831) – Black pyramid butterflyfish, brushtooth butterflyfish
Taxonomy. First record from Réunion by CHABANET (1994: 239); record confirmed by FRICKE (1999: 342), based on MNHN material.
Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles. Marine species. Found in open water off coral or rocky reef edges, at depths of 1–35 m. Outside the area, East Africa east to Andaman Sea, north to India, south to 28°S.

Conservation. Vulnerable in Réunion (VU). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Heniochus acuminatus* (Linnaeus, 1758) – Coachman, longfin bannerfish; Pavillon (Réunion)

Taxonomy. First record from Réunion by Fourmanoir & Guézé (1963: 14); previously listed as *H. macrolepidotus* by Guichenot (1863: C26); record confirmed by Fricke (1999: 342–344), based on MHNRUN, MNHN and USNM material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Found in deep, protected lagoons and channels, and outer coral or rocky reef slopes, at depths of 2–178 m. Outside the area, East Africa and Persian Gulf east to Wake and Tuamotu islands, north to southern Japan, south to Western Australia, and Lord Howe, Tongan and Austral islands.

Conservation. Vulnerable in Réunion (VU). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Heniochus diphreutes* Jordan, 1903 – Schooling bannerfish, schooling coachman

Taxonomy. First record from Réunion by Fricke (1999: 344).

Distribution. Réunion, Mauritius. Marine species. Found along outer coral or rocky reef slopes, in current channels, at depths of 15–210 m; juveniles shallower, in aggregations around isolated patch reefs, adults in large schools well above the bottom. Outside the area, Red Sea, East and South Africa east to Hawaiian Islands, north to southern Japan and Ogasawara Islands, south to New South Wales/Australia and Kermadec Islands.

Conservation. Data deficient in Réunion (DD). Threats: EUT. Rare. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Heniochus monoceros* Cuvier in Cuvier & Valenciennes, 1831 – Masked bannerfish, masked coachman; Pavillon (Réunion), hénioche cornu (France)

Taxonomy. First record from Réunion by Guichenot (1863: C26); record confirmed by Fricke (1999: 344–345), based on BPBM, MNHN and SMNS material.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Aldabra, Seychelles. Marine species. Found in lagoon and seaward coral or rocky reefs with rich coral growth, at depths of 0–30 m. Outside the area, East Africa east to Marshall Islands and Henderson/Pitcairn Group, north to southern Japan, south to Western Australia, Norfolk and Gambier islands.

Conservation. Vulnerable in Réunion (VU). Threats: EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Prognathodes guezei* (Maugé & Bauchot, 1976) – Guézé's butterflyfish; Chétodon à demi-deuil

Taxonomy. Originally described from Réunion by Maugé & Bauchot (1976: 89–100) as *Chaetodon guezei*. Also MHNRUN material (Durville et al. submitted).

Distribution. Réunion, Mauritius, Comores. Marine species. Found on deep reefs. Endemic to volcanic islands in the southwestern Indian Ocean.

Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Local importance. Sensitivity to human activities unknown. Decline unknown. Medium priority for conservation action.

Pomacanthidae – Angelfishes

**Apolemichthys guezei* (Randall & Maugé, 1978) – Réunion angelfish

Taxonomy. Originally described from Réunion by Randall & Maugé (1978: 298–302) as *Holacanthus guezei*; record confirmed by Fricke (1999: 345), based on BPBM and MNHN material.

Distribution. Réunion. Marine species. Found in deeper coral reef habitats, at depths of 60–80 m. Endemic to Réunion.

Conservation. Endangered in Réunion (EN). Threats: FIB, EUT. Global importance. Rare. Sensitive to human activities. Significant decline. High priority for conservation action. Proposed for Annexes II and IV of the EU Habitats Directive.

*Apolemichthys trimaculatus* (Cuvier [ex Lacepède] in Cuvier & Valenciennes, 1831) – Threespot angelfish, flagfin angelfish; Poisson-ange à trois taches

Taxonomy. First record from Réunion by Guichenot (1863: C26) as *Holacanthus trimaculatus*; record confirmed by Fricke (1999: 345–346), based on MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Aldabra, Amirantes, Seychelles, Cargados Carajos. Marine species. Found in lagoon and seaward coral or rocky reef habitats, at depths of 2–40 m. Outside the area, East Africa east to Marshall Islands, Samoa and Tonga, north to southern Japan, south to Western Australia, Queensland/Australia, and New Caledonia.

Conservation. Vulnerable in Réunion (VU). Threats: PRL, HAB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Apolemichthys xanthurus* (Bennett, 1833) – Indian yellowtail angelfish

Taxonomy. First record from Réunion by Fricke (1999: 346).

Distribution. Réunion, Mauritius, Rodrigues. Marine species. Found in coral-rich reef habitats, at depths of 3–20 m. Outside the area, India, Maldives and Sri Lanka.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Very sensitive to human activities. Probable decline. Medium priority for conservation action.

*Centropyge acanthops* (Norman, 1922) – African pygmy angelfish, jumping bean, orangeback angelfish

Taxonomy. First record from Réunion by Letourneur (1992: unpag. 4).

Distribution. Réunion, Mauritius, Madagascar, Seychelles, Cargados Carajos. Marine species. Found in coral rubble areas adjacent to coral reefs, at depths of 6–40 m. Outside the area, East and South Africa east to Maldives and Chagos Archipelago.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Centropyge bispinosa* (Günther, 1860) – Coral beauty

Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 94) as *C. bispinnosus*; record confirmed by Fricke (1999: 347) as *C. diacanthus* [which was replaced as a secondary homonym of *Chaetodon diacanthus* Boddaert, 1782 by Günther (1860: 48, 516), and is invalid according to Art. 59.3 of the ICZN Code], based on BPBM material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra. Marine species. Found on steep outer coral or rocky reef slopes, at depths of 5–45 m. Outside the area, East Africa east to Marshall and Tuamotu islands, north to

Izu Islands, south to Western Australia, Lord Howe Island, and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Centropyge debelius* Pyle, 1990 – Blue Mauritius angelfish
Taxonomy. First record from Réunion by DEBELIUS (1993: 166); previously listed by RANDALL (1982: 205) as *C. interruptus* (non Tanaka, 1918); record confirmed by FRICKE (1999: 346–347), based on MNHN material.
Distribution. Réunion, Mauritius, Aldabra. Marine species. Found in seaward slopes of coral reefs, at depths of 46–90 m. Endemic to islands in the southwestern Indian Ocean.
Conservation. Near threatened in Réunion (NT). Threats: HAB, EUT. Local importance. Rare. Sensitive to human activities. Decline unknown. High priority for conservation action.

*Centropyge multispinis* (Playfair in Playfair & Günther, 1867) – Dusky angelfish, dusky cherub
Taxonomy. First record from Réunion by CHABANET (1994: 239); record confirmed by FRICKE (1999: 348), based on BPBM material.
Distribution. Réunion, Mauritius, Comores, Madagascar, Aldabra, Amirantes, Seychelles, Cargados Carajos. Marine species. Found in coral-rich and coral rubble areas of lagoon and seaward coral reefs, at depths of 0–25 m. Outside the area, Natal/South Africa and East Africa east to Andaman Sea.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Genicanthus caudovittatus* (Günther, 1860) – Zebra angelfish, swallowtail angelfish
Taxonomy. First record from Réunion by FRICKE (1999: 348), based on MNHN material.
Distribution. Réunion, Mauritius, Comores, Madagascar. Marine species. Found in seaward coral reefs, at depths of 30–200 m. Outside the area, Red Sea, East and South Africa east to Maldives.
Conservation. Data deficient in Réunion (DD). Threats: FIB, HAB, EUT. Sensitive to human activities. Decline unknown. Medium priority for conservation action.

*Pomacanthus imperator* (Bloch, 1787) – Emperor angelfish; Poisson-ange impérial
Taxonomy. First record from Réunion by HARMELIN-VIVIEN (1976: 95); record confirmed by FRICKE (1999: 349), based on MHNRUN and MNHN material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Amirantes, Seychelles, Cargados Carajos. Marine species. Juveniles found in semi-protected channels and on outer reef flats; adults under ledges and in caves of coral-rich lagoon and seaward coral and rocky reefs; at depths of 1–100 m. Outside the area, Red Sea and East Africa east to Hawaiian Islands and Pitcairn Group, north to southern Japan and Ogasawara Islands, south to Western Australia, Lord Howe, Tongan and Austral islands.
Conservation. Vulnerable in Réunion (VU). Threats: HAB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Pomacanthus semicirculatus* (Cuvier in Cuvier & Valenciennes, 1831) – Semicircle angelfish; Poisson-ange bleu
Taxonomy. First record from Réunion by HARMELIN-VIVIEN (1976: 95).
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Juveniles found in tidal pools, semi-protected channels and on outer reef flats; adults under ledges and in caves of coral-rich lagoon and seaward reefs; at depths of 1–30 m. Outside the area, Red Sea and East Africa east to Samoa and Tonga, north to southern Japan, south to Western Australia, New South Wales/Australia and New Caledonia.
Conservation. Extinct in Réunion (RE), according to LETOURNEUR et al. (2004: 208). Threats: HAB, EUT. Sensitive to human activities. High priority for conservation action. Reintroduction into suitable habitats might be considered under scientific guidance.

## Pentacerotidae – Armourheads

*Histiopterus typus* Temminck & Schlegel, 1844 – Sailfin armourhead
Taxonomy. First record from Réunion by FRICKE (1999: 351), based on MNHN material.
Distribution. Réunion, Comores. Marine species. Found on deep rocky reefs, at depths of 40–400 m. Outside the area, Red Sea, East and South Africa east to Philippines and New Britain/Papua New Guinea, north to southern Japan, south to northern Australia.
Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitivity to human activities unknown. Decline unknown. Medium priority for conservation action.

*Pentaceros capensis* Cuvier in Cuvier & Valenciennes, 1829 – Cape armourhead
Taxonomy. First record from Réunion by LETOURNEUR et al. (2004: 204), based on MNHN material.
Distribution. Réunion. Marine species. Found on deep rocky reefs, at depths of 70–300 m. Outside the area, southeastern Atlantic and temperate southwestern Indian Ocean.
Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitivity to human activities unknown. Decline unknown. Medium priority for conservation action.

## Cirrhitidae – Hawkfishes

*Amblycirrhitus bimacula* (Jenkins, 1903) – Twospot hawkfish
Taxonomy. **New record** from Réunion, based on specimens observed during a visual census, on the outer coral reef, in 2004 (P. DURVILLE, E. TESSIER, T. MULOCHAU, P. CHABANET).
Distribution. Réunion, Mauritius, Comores, Madagascar, Cargados Carajos. Marine species. Secretive in coral and rocky reefs, at depths of 0–20 m. Outside the area, East and South Africa east to Pitcairn Group, north to Taiwan.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitivity to human activities unknown. Probable decline. Medium priority for conservation action.

*Cirrhitichthys guichenoti* (Sauvage, 1880) – Guichenot's hawkfish; Niche-madame (Réunion)
Taxonomy. Originally described from Réunion by SAUVAGE (1880: 221–222) as *Cirrhites Guichenoti*; previously listed as *Cirrhitichthys oxycephalus* (non Bleeker, 1855) by GUICHENOT (1863: C24); subsequently listed as *Cirrhitichthys aprinus* (non Cuvier in Cuvier & Valenciennes, 1829) by BLEEKER (1874: 93).
Distribution. Réunion, Mauritius, Comores, Madagascar. Marine species. Found in lagoon and seaward coral reefs, asso-

ciated with live corals, at depths of 20–260 m. Endemic to islands in the southwestern Indian Ocean.
Conservation. Critically endangered in Réunion (CR). Threats: HOS, HAB, EUT. Local importance. Rare. Very sensitive to human activities. Severe decline. High priority for conservation action.

*Cirrhitops fasciatus* Bennett, 1828 – Redbar hawkfish
Taxonomy. First record from Réunion by Letourneur (1998: 282) as *Cirrhitus fasciatus*; previously listed as *Cirrhites cinctus* by Blanc & Postel (1958: 369); record confirmed by Fricke (1999: 352–353), based on BPBM and MNHN material.
Distribution. Réunion, Mauritius, Madagascar. Marine species. Found in seaward coral reefs in areas of moderate to rich coral growth, at depths of 2–30 m. Outside the area, southern Japan; Hawaiian Islands. Anti-equatorial and east-west disjunct distribution according to Randall (1982: 424–425).
Conservation. Critically endangered in Réunion (CR). Threats: HOS, HAB, EUT. Very sensitive to human activities. Severe decline. High priority for conservation action.

*Cirrhitus pinnulatus* (Bloch & Schneider [ex Forster], 1801) – Stocky hawkfish; Domingue (Réunion)
Taxonomy. First record from Réunion by Fourmanoir & Guézé (1963: 11) as *Cirrhitus pinnulatus*; previously listed as *Cirrhites maculatus* by Guichenot (1863: C24), and as *Cirrhites marmoratus* by Bleeker (1874: 93); record confirmed by Fricke (1999: 353–354), based on MHNRUN material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles. Marine species. Found in rocky and coral reefs exposed to moderate to strong surge, at depths of 0–3 m. Outside the area, East Africa to Hawaiian Islands and Pitcairn Group, north to southern Japan, south to Kermadec Islands and Rapa.
Conservation. Vulnerable in Réunion (VU). Threats: HAB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Cristacirrhitus punctatus* Cuvier in Cuvier & Valenciennes, 1829 – Black-spotted hawkfish
Taxonomy. First record from Réunion by Bleeker (1866b) as *Cirrhites punctatus*.
Distribution. Réunion, Mauritius, Madagascar. Marine species. Found on coral or rocky reefs in shallow waters. Outside the area, South Africa to Mozambique.
Conservation. Vulnerable in Réunion (VU). Threats: HAB, EUT. Rare. Sensitive to human activities. Significant decline. High priority for conservation action.

*Cyprinocirrhites polyactis* (Bleeker, 1875) – Swallowtail hawkfish
Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 97); record confirmed by Fricke (1999: 354–355), based on MNHN and SAIAB material.
Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Found on steep slopes of coral or rocky reefs, and around small coral heads exposed to currents, at depths of 10–132 m. Outside the area, East Africa east to Marquesas Islands, north to southern Japan, south to Western Australia, northern New Zealand and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: HOS, HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Oxycirrhites typus* Bleeker, 1857 – Longnose hawkfish
Taxonomy. First record from Réunion by Fricke (1999: 355), based on MNHN material.
Distribution. Réunion, Mauritius, Seychelles. Marine species. Found on steep outer coral reef slopes exposed to strong currents where it lives on large gorgonians and black corals, at depths of 10–100 m. Outside the area, Red Sea and Seychelles east to Panama, north to southern Japan, south to Western Australia, New Caledonia and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: HOS, HAB, EUT. Very sensitive to human activities. Probable decline. Medium priority for conservation action.

*Paracirrhites arcatus* (Cuvier [ex Parkinson] in Cuvier & Valenciennes, 1829) – Arc-eye hawkfish, horseshoe hawkfish
Taxonomy. First record from Réunion by Bleeker (1874: 93); record confirmed by Fricke (1999: 355–356), based on MHNRUN and MNHN material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Aldabra. Marine species. Found in lagoon and seaward reefs, at depths of 1–33 m, on heads of small branching corals including *Stylophora*, *Pocillopora*, *Acropora*. Outside the area, East Africa east to Hawaiian Islands and Pitcairn Group, north to southern Japan, south to Western Australia, Norfolk Island and Rapa.
Conservation. Critically endangered in Réunion (CR). Threats: HOS, HAB, EUT. Very sensitive to human activities. Severe decline. High priority for conservation action.

*Paracirrhites forsteri* (Schneider in Bloch & Schneider, 1801) – Freckled hawkfish, blackside hawkfish
Taxonomy. First record from Réunion by Bleeker (1874: 93) as *P. Forsteri*; previously recorded as *Cirrhites pantherinus* by Guichenot (1863: C24); record confirmed by Fricke (1999: 356–357), based on MNHN material.
Distribution. Réunion, Mauritius, Comores, Madagascar, Aldabra, Seychelles, Cargados Carajos. Marine species. Found in lagoon and seaward reefs at depths of 1–33 m, among outer branches of *Stylophora*, *Pocillopora* or *Acropora* corals. Outside the area, Red Sea and East Africa east to Hawaiian Islands and Pitcairn Group, north to southern Japan, south to Western Australia, New South Wales/Australia, Lord Howe and Austral islands.
Conservation. Critically endangered in Réunion (CR). Threats: HOS, HAB, EUT. Very sensitive to human activities. Severe decline. High priority for conservation action.

## Cichlidae – Cichlids

*Amatitlania nigrofasciata* (Günther, 1867) – Convict cichlid
Taxonomy. First record from Réunion as *Archocentrus nigrofasciatus* by Valade (2008: 5).
Distribution. Réunion. Introduced. Freshwater. Outside the area, originally Pacific slope of Central America. Introduced worldwide into tropical freshwater habitats.
Conservation. Not evaluated in Réunion (NE). No conservation scheme in favour of this species, as it is not native.

*Oreochromis macrochir* (Boulenger, 1912) – Longfin tilapia
Taxonomy. First record from Réunion by Keith et al. (1999: 102). Discussion about hybridisation with three other introduced cichlid species see Keith et al. (1999: 102).
Distribution. Réunion. Introduced since between 1950 and 1956 (Keith et al. 1999: 102). Freshwater and transitional water. Outside the area, originally western Africa in Kafue, upper

Zambezi, and Congo River systems. Widely introduced into tropical freshwater habitats.
Conservation. Not evaluated in Réunion (NE). No conservation scheme in favour of this species, as it is not native.

*Oreochromis mossambicus* (Peters, 1852) – Mozambique tilapia
Taxonomy. First record from Réunion by KEITH et al. (1999: 102). Discussion about hybridisation with three other introduced cichlid species see KEITH et al. (1999: 102).
Distribution. Réunion. Introduced since between 1950 and 1956 (KEITH et al. 1999: 102). Freshwater and transitional water. Outside the area, originally southeastern and southern Africa. Introduced worldwide into tropical freshwater habitats.
Conservation. Not evaluated in Réunion (NE). No conservation scheme in favour of this species, as it is not native.

*Oreochromis niloticus* (Linnaeus, 1758) – Nile tilapia; Lapia, petit lapia (Réunion), tilapia (France)
Taxonomy. First record from Réunion by MARQUET et al. (1997: 30); record confirmed by FRICKE (1999: 362), based on MNHN material. Discussion about hybridisation with three other introduced cichlid species see KEITH et al. (1999: 102).
Distribution. Réunion. Introduced since between 1950 and 1956 (KEITH et al. 1999: 102). Freshwater and transitional water. Outside the area, originally Nile River and adjacent watersheds. Introduced worldwide into tropical fresh and brackish water habitats.
Conservation. Not evaluated in Réunion (NE). No conservation scheme in favour of this species, as it is not native.

*Tilapia zillii* (Gervais, 1848) – Redbelly tilapia
Taxonomy. First record from Réunion by KEITH et al. (1999: 102). Discussion about hybridisation with three other introduced cichlid species see KEITH et al. (1999: 102).
Distribution. Réunion. Introduced since between 1950 and 1956 (KEITH et al. 1999: 102). Freshwater and transitional water. Outside the area, originally northern and western Africa northeast to Jordan system. Introduced worldwide into tropical freshwater habitats.
Conservation. Not evaluated in Réunion (NE). No conservation scheme in favour of this species, as it is not native.

## Pomacentridae – Damselfishes

*Abudefduf margariteus* (Cuvier in Cuvier & Valenciennes, 1830) – Pearly sergeant
Taxonomy. First record from Réunion by GUICHENOT (1863: C25) as *Glyphisodon margariteus*; subsequently described as *Glyhidodon rhyncholepis* by BLEEKER (1869: 230–232); record confirmed by FRICKE (1999: 363–364), based on RMNH, SMNS and USNM material.
Distribution. Réunion, Mauritius, Rodrigues. Marine species. Found on rocky and coral reefs in shallow water, including the reef flat and tidal pools. Endemic to Mascarenes.
Conservation. Vulnerable in Réunion (VU). Threats: HAB, EUT. Local importance. Sensitive to human activities. Significant decline. High priority for conservation action. Proposed for Annexes II and IV of the EU Habitats Directive.

*Abudefduf septemfasciatus* (Cuvier in Cuvier & Valenciennes, 1830) – Banded sergeant, sevenbar damsel; Sergent-major
Taxonomy. First record from Réunion by HARMELIN-VIVIEN (1976: 95) as *A. septemfasciatus* and *A. saxatilis* (non Linnaeus, 1758); record confirmed by FRICKE (1999: 364), based on MHNRUN and USNM material.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Aldabra, Seychelles. Marine species. Found in shallow lagoon and outer coral reefs exposed to mild or moderate surge. Outside the area, East Africa east to Line and Gambier islands, north to Izu Islands, south to Western Australia, New South Wales/Australia, New Caledonia and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Abudefduf sexfasciatus* (Lacepède [ex Commerson], 1801) – Scissortail sergeant, stripetail damsel
Taxonomy. First record from Réunion by FOURMANOIR & GUÉZÉ (1963: 13); previously listed as *Glyphisodon celestinus* by GUICHENOT (1863: C25); record confirmed by FRICKE (1999: 365), based on MHNRUN and USNM material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles. Marine species. Found on inshore and offshore coral reefs and reef flats, including lagoon habitats, at depths of 0–15 m. Outside the area, Red Sea and East Africa east to Marquesas and Gambier islands, north to southern Japan, south to Western Australia, New South Wales/Australia, Lord Howe Island, Tonga and Rapa.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Abudefduf sordidus* (Forsskål in Niebuhr, 1775) – Blackspot sergeant, spot damsel
Taxonomy. First record from Réunion by GUICHENOT (1863: C25) as *Glyphisodon sordidus*; record confirmed by FRICKE (1999: 366), based on SMNS and USNM material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles. Marine species. Found in rocky lagoons, dead coral, reef flat shorelines and piers subject to mild surge; juveniles are common in tide pools; at depths of 0–3 m. Outside the area, Red Sea and East Africa east to Wake Atoll and Pitcairn Group, north to southern Japan, south to Western Australia, New South Wales/Australia, Lord Howe Island, Tonga and Rapa.
Conservation. Least concern in Réunion (LC). Threats: EUT. Sensitivity to human activities unknown. Keystone species. Stable populations. Medium priority for conservation action.

*Abudefduf sparoides* (Quoy & Gaimard, 1825) – False-eye sergeant, false-eye damsel
Taxonomy. First record from Réunion by GUICHENOT (1863: C25) as *Glyphisodon sparoides*; record confirmed by FRICKE (1999: 366–368), based on LEMUR, SMNS and USNM material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra. Marine species. Found on rocky and coral reefs including reef flats and tidal pools, at depths of 0–6 m. Outside the area, Kenya south to Natal/South Africa.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Abudefduf vaigiensis* (Quoy & Gaimard, 1825) – Indo-Pacific sergeant
Taxonomy. First record from Réunion by LETOURNEUR (1992: 53); listed by HARMELIN-VIVIEN (1976: 95) as *A. saxatilis* (non Linnaeus, 1758); record confirmed by FRICKE (1999: 368), based on SMNS material.
Distribution. Réunion, Madagascar. Marine species. Found on inshore rocky reefs and lagoons and outer reef slopes, at depths of 0–15 m. Outside the area, East Africa east to Sa-

moa and Tonga, north to southern Japan, south to Western Australia, New South Wales/Australia, and northern New Zealand.
Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitivity to human activities unknown. Keystone species. Probable decline. Medium priority for conservation action.

*Amphiprion allardi* Klausewitz, 1970 – Twobar anemonefish, Allard's anemonefish
Taxonomy. First record from Réunion by Fricke (1999: 368–369); previously listed by Guichenot (1863: C25) as *A. trifasciatus* (non Cuvier in Cuvier & Valenciennes, 1830), and by Fourmanoir & Guézé (1963: 13) as *A. polymnus* (non Linnaeus, 1758).
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Marine species. Found in lagoons and outer coral reefs, associated with anemones, at depths of 0–30 m. Outside the area, East Africa south to Durban/South Africa. Endemic to southwestern Indian Ocean.
Conservation. Data deficient in Réunion (DD). Threats: HOS, HAB, EUT. Sensitive to human activities. Decline unknown. Low priority for conservation action.

*Amphiprion chrysogaster* Cuvier in Cuvier & Valenciennes, 1830 – Mauritian anemonefish
Taxonomy. First record from Réunion by Letourneur (1998: 282).
Distribution. Réunion, Mauritius, Rodrigues, Madagascar. Marine species. Found in lagoons and outer coral or rocky reefs, associated with anemones, at depths of 0–40 m. Endemic to islands in the southwestern Indian Ocean.
Conservation. Data deficient in Réunion (DD). Threats: HOS, HAB, EUT. Rare. Sensitive to human activities. Decline unknown. Medium priority for conservation action.

*Chromis agilis* Smith, 1960 – Reef chromis, agile chromis
Taxonomy. First record from Réunion by Cuvier in Cuvier & Valenciennes (1830a: 400–401); record confirmed by Fricke (1999: 369–370), based on MNHN material.
Distribution. Réunion. Marine species. Found in clear lagoons and seaward reefs, near branching corals, often associated with caves and ledges, at depths of 1–65 m. Outside the area, East Africa east to Wake Atoll and Pitcairn Group, north to Ogasawara Islands, south to Elizabeth Reef, Tonga and Rapa.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Chromis atripectoralis* Welander & Schultz, 1951 – Black-axil chromis
Taxonomy. First record from Réunion by Fricke (1999: 370), based on SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Seychelles. Marine species. Found in clear lagoons, passages and seaward coral reefs, around thick packages of live or dead corals, at depths of 0–29 m. Outside the area, Maldives east to Tuamotu and Gambier islands, north to Ryukyu Islands, south to Western Australia, Lord Howe Island and Rapa.
Conservation. Vulnerable in Réunion (VU). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Chromis axillaris* (Bennett, 1831) – Grey chromis
Taxonomy. First record from Réunion by Durville et al. (submitted), based on MHNRUN material.
Distribution. Réunion, Mauritius, Walters Shoal. Marine species. Found on deep reefs, at depths of 40–80 m. Outside the area, Red Sea and East Africa.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Chromis chrysura* (Bliss, 1883) – Stout-body chromis
Taxonomy. First record from Réunion by Allen (1991: 64); record confirmed by Fricke (1999: 370–371), based on BPBM material. Also MHNRUN material.
Distribution. Réunion, Mauritius, Rodrigues. Marine species. Found in outer coral and rocky reefs, at depths of 6–45 m. Outside the area, east to Fiji and Tonga, north to southern Japan, south to New South Wales/Australia and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Chromis dimidiata* (Klunzinger, 1871) – Chocolate dip
Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 96); record confirmed by Fricke (1999: 371), based on BPBM material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles. Marine species. Found in lagoon and seaward coral or rocky reefs, at depths of 0–36 m. Outside the area, Red Sea, East Africa and Natal/South Africa east to Andaman Sea and Christmas Island (eastern Indian Ocean).
Conservation. Vulnerable in Réunion (VU). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Chromis leucura* Gilbert, 1905 – Whitetail chromis
Taxonomy. First record from Réunion by Allen (1991: 72).
Distribution. Réunion, Mauritius, Rodrigues, Madagascar. Marine species. Found on outer coral or rocky reefs, at depths of 20–119 m. Outside the area, Hawaiian, Marquesas and Gambier islands, Ryukyu Islands, eastern Indonesia, New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Chromis nigrura* Smith, 1960 – Blacktail chromis
Taxonomy. First record from Réunion by Chabanet (1994: 240); record confirmed by Fricke (1999: 372), based on BPBM material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra. Marine species. Found on the outer reef, in coral-rich areas, at depths of 1–30 m. Outside the area, Transkei/South Africa and East Africa east to Maldives and Chagos Archipelago.
Conservation. Vulnerable in Réunion (VU). Threats: HOS, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Chromis opercularis* (Günther in Playfair & Günther, 1867) – Doublebar chromis
Taxonomy. **New record** from Réunion, based on a specimen collected during a visual census, on the outer coral reef, in 2004 (P. Durville, E. Tessier, T. Mulochau, P. Chabanet). Listed from Réunion as *Chromis* cf. *opercularis* by Harmelin-Vivien (1976: 96).
Distribution. Réunion, Seychelles. Marine species. Found on reef slopes, at depths of 4–40 m. Outside the area, East and

South Africa east to Andaman Sea and Christmas Island (eastern Indian Ocean).
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitivity to human activities unknown. Probable decline. Medium priority for conservation action.

*Chromis ternatensis* (Bleeker, 1856) – Golden chromis, blue-green chromis
Taxonomy. First record from Réunion by LETOURNEUR (1998: 282); previously listed by HARMELIN-VIVIEN (1976: 96) as *C. caeruleus* and *C. simulans* (non Smith, 1960).
Distribution. Réunion, Mauritius, Comores, Madagascar. Marine species. Found around branching corals in clear lagoon reefs and outer reef slopes, at depths of 1–36 m. Outside the area, Red Sea and East Africa east to Mariana Islands, Samoa and Tonga, north to Ryukyu Islands, south to Western Australia, Queensland/Australia and New Caledonia.
Conservation. Vulnerable in Réunion (VU). Threats: HOS, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Chromis viridis* Cuvier [ex Ehrenberg] in Cuvier & Valenciennes, 1830 – Green chromis, blue-green chromis; Petit cafre (Réunion), demoiselle bleue (France)
Taxonomy. First record from Réunion by LETOURNEUR (1992: 109); previously listed by GUICHENOT (1863: C25) as *Heliastes cinerascens* (non Cuvier in Cuvier & Valenciennes, 1830); record confirmed by FRICKE (1999: 373–374), based on MHNRUN and SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar. Marine species. Found in large aggregations above thickets of branching *Acropora* corals in sheltered areas of subtidal reef flats and lagoons, at depths of 1–20 m. Outside the area, Red Sea and East Africa east to Wake Atoll, Marquesas and Tuamotu islands, north to Ryukyu Islands, south to Western Australia, Middleton Reef, New Caledonia and Tonga.
Conservation. Vulnerable in Réunion (VU). Threats: HOS, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Chromis weberi* Fowler & Bean, 1928 – Weber's chromis
Taxonomy. **New record** from Réunion, based on a specimen observed during a visual census, on the outer coral reef, in 2004 (P. DURVILLE, E. TESSIER, T. MULOCHAU, P. CHABANET).
Distribution. Réunion, Madagascar, Aldabra, Agalega Islands. Marine species. Found on reef slopes, at depths of 3–40 m. Outside the area, Red Sea and East Africa to the Line Islands, north to southern Japan, south to New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitivity to human activities unknown. Probable decline. Medium priority for conservation action.

*Chromis xanthura* (Bleeker, 1854) – Paletail chromis, variable chromis
Taxonomy. First record from Réunion by LETOURNEUR (1998: 282) as *C. xanthurus*; record confirmed by FRICKE (1999: 374), based on BPBM material.
Distribution. Réunion. Marine species. Found above steep outer coral or rocky reef slopes and shallow coastal reef flats, sometimes forming large aggregations feeding on zooplankton several metres above the bottom, at depths of 3–40 m. Outside the area, Cocos-Keeling and Christmas islands (eastern Indian Ocean) east to Pitcairn Group, north to southern Japan, south to Western Australia, Queensland/Australia, New Caledonia and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Chrysiptera annulata* (Peters, 1855) – Footballer demoiselle
Taxonomy. First record from Réunion by ALLEN (1991: 90).
Distribution. Réunion, Mauritius, Madagascar, Aldabra, Seychelles. Marine species. Found in lagoon and inshore seagrass and sand flats adjacent to coral reefs, at depths of 0–3 m. Outside the area, Red Sea, East Africa and Durban/South Africa.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Chrysiptera brownriggii* (Bennett, 1828) – Surge demoiselle, blueribbon demoiselle
Taxonomy. **New record** from Réunion; previously listed as *Abudefduf biocellatus* (non Quoy & Gaimard, 1825), *A. xanthozonus*, and *A. zonatus* (non Cuvier in Cuvier & Valenciennes, 1830) by HARMELIN-VIVIEN (1976: 95), and as *Chrysiptera leucopoma* by FRICKE (1999: 375–376), based on SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles. Marine species. Found on rubble-strewn surge channels, the outermost reaches of exposed reef flats, and the upper submarine terrace, at depths of 0–12 m. Outside the area, East Africa east to Wake and Marquesas islands, north to southern Japan, south to Western Australia, New South Wales/Australia, New Caledonia and Austral Islands.
Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitive to human activities. Keystone species. Decline unknown. Medium priority for conservation action.

*Chrysiptera glauca* (Cuvier in Cuvier & Valenciennes, 1830) – Grey demoiselle, blue damsel
Taxonomy. First record from Réunion by HARMELIN-VIVIEN (1976: 95) as *Abudefduf glaucus*; record confirmed by FRICKE (1999: 374–375), based on LEMUR, MNHN and SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Aldabra, Seychelles. Transitional water and marine. Found among rubble or consolidated reef rock of exposed intertidal reef flats and sandy beaches, subject to mild surge; also near freshwater run-offs, at depths of 0–3 m. Outside the area, South and East Africa east to Wake, Line and Gambier islands, north to Izu Islands, south to Western Australia, Lord Howe Island, and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitive to human activities. Keystone species. Decline unknown. Medium priority for conservation action.

*Chrysiptera unimaculata* (Cuvier in Cuvier & Valenciennes, 1830) – Onespot demoiselle
Taxonomy. First record from Réunion by LETOURNEUR (1991: 164); record confirmed by FRICKE (1999: 376), based on MNHN, SMNS and USNM material.
Distribution. Réunion, Mauritius, Madagascar. Marine species. Found solitarily or in small groups among coastal algal reefs, rubble or over open beach-rock of reef flats exposed to moderate surge, at depths of 0–3 m. Outside the area, Red Sea, East Africa and Oman east to Fiji and Tonga, north to southern Japan, south to Queensland/Australia.
Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitive to human activities. Decline unknown. Low priority for conservation action.

*Dascyllus aruanus* (Linnaeus, 1758) – Humbug dascyllus, zebra humbug, whitetail dascyllus

Taxonomy. First record from Réunion by GUICHENOT (1863: C25); record confirmed by FRICKE (1999: 376–378), based on LEMUR, MNHN and SMNS material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Farquhar Islands, Cargados Carajos, Seychelles. Marine species. Found in shallow lagoon and subtidal reef flats, forming large aggregations above staghorn *Acropora* thickets or smaller groups above isolated coral heads, at depths of 0–20 m. Outside the area, Red Sea and East Africa east to Wake, Marquesas and Gambier islands, north to Ryukyu Islands, south to Western Australia, Lord Howe Island and Rapa.

Conservation. Vulnerable in Réunion (VU). Threats: HOS, HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Dascyllus carneus* Fischer, 1885 – Twobar humbug, cloudy dascyllus

Taxonomy. First record from Réunion by RANDALL & ALLEN (1977: 368–372).

Distribution. Réunion, Mauritius, Comores, Madagascar, Cargados Carajos, Aldabra, Amirantes, Seychelles. Marine species. Found among branching corals on inshore and offshore reefs, occasionally also on rocky reefs, at depths of 4–40 m. Outside the area, South and East Africa east to Andaman and Java seas.

Conservation. Endangered in Réunion (EN). Threats: HOS, HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action. Proposed for Annexes II and IV of the EU Habitats Directive.

*Dascyllus trimaculatus* (Rüppell, 1829) – Domino, threespot dascyllus; Demoiselle à trois taches

Taxonomy. First record from Réunion by FOURMANOIR & GUÉZÉ (1963: 14).

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles, Cargados Carajos. Marine species. Found in coral and rocky reefs, juveniles often commensal with large sea anemones, sea urchins, or small coral heads; at depths of 0–55 m. Outside the area, Red Sea and East Africa east to Marshall Islands and Pitcairn Group, north to southern Japan, south to Western Australia, New South Wales/Australia, Lord Howe and Austral islands.

Conservation. Data deficient in Réunion (DD). Threats: HOS, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Neoglyphidodon melas* (Cuvier [ex Kuhl & Hasselt] in Cuvier & Valenciennes, 1830) – Bowtie damselfish

Taxonomy. First record from Réunion by LETOURNEUR et al. (2004: 204).

Distribution. Réunion, Mauritius, Madagascar. Marine species. Found in coral-rich areas of lagoon and seaward reefs and usually associated with soft corals on which it feeds, at depths of 0–12 m. Outside the area, Red Sea and East Africa east to Philippines and Vanuatu, north to Ryukyu Islands, south to northern Australia.

Conservation. Endangered in Réunion (EN). Threats: HOS, HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action.

*Plectroglyphidodon dickii* (Liénard, 1839) – Narrowbar damsel, Dick's damsel, blackbar devil

Taxonomy. First record from Réunion by HARMELIN-VIVIEN (1976: 95); record confirmed by FRICKE (1999: 379–380), based on BPBM, LEMUR, MNHN and SMNS material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles. Marine species. Found in coral-rich and surge areas of clear lagoon and seaward reefs, commonly associated with *Pocillopora* or *Acropora* corals, at depths of 0–15 m. Outside the area, South and East Africa east to Wake, Marquesas and Tuamotu islands, north to southern Japan, south to Western Australia, Lord Howe Island, and Tonga.

Conservation. Endangered in Réunion (EN). Threats: HOS, HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action. Proposed for Annexes II and IV of the EU Habitats Directive.

*Plectroglyphidodon imparipennis* (Sauvage in Vaillant & Sauvage, 1875) – Brighteye damsel, stop-start damsel

Taxonomy. First record from Réunion by HARMELIN-VIVIEN (1976: 95) as *Abudefduf imparipennis*; record confirmed by FRICKE (1999: 380), based on SMNS material.

Distribution. Réunion, Mauritius, Rodrigues, Aldabra, Seychelles. Marine species. Found in coral-rich and surge areas of clear lagoon and seaward reefs, commonly associated with *Pocillopora* or *Acropora* corals, at depths of 0–15 m. Outside the area, South and East Africa east to Minami-tori-shima, Hawaiian Islands and Pitcairn Group, north to Ryukyu Islands, south to Western Australia and Austral Islands.

Conservation. Endangered in Réunion (EN). Threats: HOS, HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action.

*Plectroglyphidodon johnstonianus* Fowler & Ball, 1924 – Johnston damsel, widebar damsel

Taxonomy. First record from Réunion by LETOURNEUR (1992: unpag. 5); previously listed by HARMELIN-VIVIEN (1976: 96) as *P. nitidus*; record confirmed by FRICKE (1999: 381), based on BPBM, LEMUR and SMNS material.

Distribution. Réunion, Mauritius, Rodrigues, Aldabra. Marine species. Found in inner to outer reef crests in rich coral habitat, frequently associated with *Acropora*, *Stylophora*, or *Pocillopora* coral heads, at depths of 0–18 m. Outside the area, East Africa east to Hawaiian Islands and Pitcairn Group, north to Ryukyu and Ogasawara islands, south to Western Australia, Lord Howe Island and Rapa.

Conservation. Endangered in Réunion (EN). Threats: HOS, HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action.

*Plectroglyphidodon lacrymatus* (Quoy & Gaimard, 1825) – White-spotted devil

Taxonomy. **New record** from Réunion, based on a specimen observed during a visual census, on the outer and inner coral reef, in 2004 (P. DURVILLE, E. TESSIER, T. MULOCHAU, P. CHABANET).

Distribution. Réunion, Mauritius (new record, based on USNM 298871 and USNM 346039), Madagascar, Amirantes, Farquhar Islands, Cargados Carajos. Marine species. Found in coral reefs, in areas with mixed coral and rubble or dead coral rocks, at depths of 1–40 m. Outside the area, Red Sea and East Africa to Marshall and Marquesas islands, north to Ryukyu Islands, south to Lord Howe and Rapa islands.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitivity to human activities unknown. Probable decline. Medium priority for conservation action.

*Plectroglyphidodon phoenixensis* (Schultz, 1943) – Phoenix devil

Taxonomy. First record from Réunion as *Plectroglyphidodon phoenixiensis* by LETOURNEUR (1991: 164); record verified through a specimen collected during a visual census, on the outer and inner coral reef, in 2004 (P. DURVILLE, E. TESSIER, T. MULOCHAU, P. CHABANET).

Distribution. Réunion, Mauritius (new record, based on USNM 346043). Marine species. Found in the surge zone of coral reefs, in or near *Acropora* or *Pocillopora* coral patches, at depths of 0–8 m. Outside the area, East Africa east to Pitcairn Group, north to Ryukyu Islands.

Conservation. Vulnerable in Réunion (VU). Threats: HAB, EUT. Sensitive to human activities. Significant decline. Medium priority for conservation action.

*Plectroglyphidodon randalli* Allen, 1991 – Mauritian damsel

Taxonomy. First record from Réunion by FRICKE (1999: 381–382), based on SMNS material; previously listed by HARMELIN-VIVIEN (1976: 95) as *Abudefduf cingulum* (non Klunzinger, 1871), and by LETOURNEUR (1992: 46, 6, 68, 109 as *Plectroglyphidodon leucozonus* (non Bleeker, 1859).

Distribution. Réunion, Mauritius. Marine species. Found on rocky reefs exposed to wave action, occasionally also on coral reef flats, at depths of 0–4 m. Endemic to western Mascarenes.

Conservation. Data deficient in Réunion (DD). Threats: EUT. Local importance. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Pomacentrus agassizii* Bliss, 1883 – Creole damsel

Taxonomy. First record from Réunion by ALLEN (1991: 136); previously listed by HARMELIN-VIVIEN (1976: 95, 96) as *P. tripunctatum* (non Cuvier in Cuvier & Valenciennes, 1830), and as *Abudefduf melas* (non Cuvier [ex Kuhl & Hasselt] in Cuvier & Valenciennes, 1830); record confirmed by FRICKE (1999: 382), based on SMNS material.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar. Marine species. Found in lagoon and inshore coral reefs, at depths of 0–4 m. Endemic to islands in the southwestern Indian Ocean.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Local importance. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Pomacentrus caeruleus* Quoy & Gaimard, 1825 – Blue pete

Taxonomy. First record from Réunion by GUICHENOT (1863: C25); subsequently listed by HARMELIN-VIVIEN (1976: 96) as *P. pulcherrimus*; record confirmed by FRICKE (1999: 382–383), based on MHNRUN material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles. Marine species. Found in lagoon and outer coral or rocky reef slopes, usually over rubble near base of reefs, at depths of 0–20 m. Outside the area, South and East Africa east to Maldives.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Pomacentrus pikei* Bliss, 1883 – Blacklip damsel

Taxonomy. First record from Réunion by ALLEN (1991: 155, 250).

Distribution. Réunion, Mauritius, Rodrigues. Marine species. Found on inshore coral and rocky reefs, at depths of 0–6 m. Endemic to Mascarenes.

Conservation. Near threatened in Réunion (NT). Threats: HAB, EUT. Local importance. Rare. Sensitive to human activities. Probable decline. High priority for conservation action. Proposed for Annex II of the EU Habitats Directive.

*Pomacentrus trichrourus* Günther in Playfair & Günther, 1867 – Yellowtail damsel, paletail damsel

Taxonomy. First record from Réunion by FRICKE (1999: 384–385), based on SMNS material; previously listed by LETOURNEUR (1992: 84, unpag 5) as *P.* cf. *chrysurus*.

Distribution. Réunion, Rodrigues, Madagascar. Marine species. Found on inshore coral reefs, at depths of 0–43 m. Outside the area, Red Sea and East Africa south to Sodwana Bay/South Africa.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Pomachromis richardsoni* (Snyder, 1909) – Richardson's damsel

Taxonomy. First record from Réunion by FRICKE (1999: 385).

Distribution. Réunion, Mauritius. Marine species. Found in coral and rocky reefs exposed to ocean swells, at depths of 2–25 m. Outside the area, east to Samoa and Tonga, north to Ryukyu Islands, south to Queensland/Australia and Loyalty Islands.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Stegastes albifasciatus* (Schlegel & Müller, 1839) – Whitebar gregory

Taxonomy. First record from Réunion by MYERS (1989: 175); record confirmed by FRICKE (1999: 385), based on SMNS material.

Distribution. Réunion, Rodrigues, Aldabra, Cargados Carajos. Marine species. Found on reef flats, in shallow lagoons, and on semi-sheltered coral or rocky reef margins; common among patches of rubble or porous reef rock, surrounded by live coral, particularly in areas of mild surge, at depths of 0–4 m. Outside the area, east to Wake, Line and Tuamotu islands, south to Western Australia, New Caledonia and Tonga.

Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitive to human activities. Decline unknown. Low priority for conservation action.

*Stegastes limbatus* (Cuvier in Cuvier & Valenciennes, 1830) – Ebony gregory

Taxonomy. Originally described from Réunion as *Glyphisodon limbatus* by CUVIER in CUVIER & VALENCIENNES (1830a: 477–478); subsequently listed as *Pomacentrus pristiger* by GUICHENOT (1863: C25), and as *P. madagascariensis* by SMITH (1960: 342, pl. 27 A); record confirmed by FRICKE (1999: 386–387), based on LEMUR, MNHN and SMNS material.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar. Marine species. Found in the surge zone of inshore boulder areas, at depths of 0–2 m. Endemic to islands in the southwestern Indian Ocean.

Conservation. Least concern in Réunion (LC). Threats: EUT. Local importance. Sensitive to human activities. Stable populations. Medium priority for conservation action.

*Stegastes luteobrunneus* (Smith, 1960) – Indian Ocean dark damsel

Taxonomy. **New record** from Réunion, based on LEMUR, MNHN, SMNS and USNM material listed by FRICKE (1999: 385–385) as *S. fasciolatus* (non Ogilby, 1889); previously

listed by LETOURNEUR (1991: 164) as *S. fasciolatus* (non Ogilby, 1889). *Stegastes fasciolatus* is restricted to Pacific Ocean (RANDALL 2005: 384–385). Taxonomic decision of the present paper (*Pomacentrus luteobrunneus* Smith, 1960 is the oldest available name for the Indian Ocean populations).

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Amirantes, Cargados Carajos. Marine species. Found on rocky and coral reefs exposed to mild to moderate surge, at depths of 0–30 m. Outside the area, Gulf of Aden, East Africa and Durban/South Africa east to Cocos-Keeling Islands.

Conservation. Least concern in Réunion (LC). Threats: EUT. Sensitive to human activities. Stable populations. Low priority for conservation action.

*Stegastes nigricans* (Lacepède [ex Commerson], 1802) – Dusky gregory

Taxonomy. Originally described from Réunion as *Holocentrus nigricans* by LACEPÈDE (1802: 332, 367, 370); record confirmed by FRICKE (1999: 388–390), based on LEMUR, MNHN and SMNS material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Farquhar Islands, Seychelles. Marine species. Found on reef flats and lagoon reefs, frequently occurring in groups associated with live or dead branching staghorn coral (*Acropora*), at depths of 0–12 m. Outside the area, Red Sea and East Africa east to Tuamotu Archipelago, north to Wake Atoll, south to Western Australia, New Caledonia and Tonga.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Decline unknown. Low priority for conservation action.

*Stegastes pelicieri* Allen & Emery, 1985 – Mauritian gregory

Taxonomy. First record from Réunion by ALLEN (1991: 181, 254); previously listed by HARMELIN-VIVIEN (1976: 95) as *Abudefduf lacrymatus* (non Quoy & Gaimard, 1825); record confirmed by FRICKE (1999: 390–391), based on LEMUR, SMNS and USNM material.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar. Marine species. Found on rocky reefs with little coral and found near crevices and holes, at depths of 0–20 m. Endemic to islands in the southwestern Indian Ocean.

Conservation. Near threatened in Réunion (NT). Threats: EUT. Local importance. Sensitive to human activities. Decline unknown. Medium priority for conservation action.

*Stegastes punctatus* (Quoy & Gaimard, 1825) – Bluntsnout gregory, farmerfish

Taxonomy. **New record** from Réunion, based on SMNS material listed by FRICKE (1999: 387–388) as *S. lividus* (non Bloch & Schneider [ex Forster], 1801), and LETOURNEUR (1992: 25, unpag. 5). *S. lividus* (Bloch & Schneider [ex Forster], 1801) is restricted to Marquesas Islands according to RANDALL (2005: 385).

Distribution. Réunion, Mauritius, Madagascar, Aldabra, Seychelles. Marine species. Found in coral reef areas with dead staghorn corals, at depths of 0–5 m. Outside the area, Red Sea and East Africa east to Tuamotu Archipelago, north to southern Japan, south to Western Australia, New Caledonia and Tonga.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Decline unknown. Low priority for conservation action.

## Labridae – Wrasses

*Anampses caeruleopunctatus* Rüppell, 1829 – Blue-spotted wrasse, blue-spotted tamarin; Labre constellé (female), labre bleu (male)

Taxonomy. First record from Réunion by GUICHENOT (1863: C28) as *A. caeruleo-punctatus*; subsequently listed as *A. diadematus* by FOURMANOIR & GUÉZÉ (1961a: 12); record confirmed by FRICKE (1999: 391–392), based on MHNRUN material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles. Marine species. Found in the surge zone of coral reefs or rocky coasts, at depths of 3–30 m. Outside the area, Red Sea and East Africa east to Wake, Line and Easter islands, north to southern Japan, south to Rowley Shoals/Western Australia, New South Wales/Australia, Lord Howe and Kermadec islands, and Rapa.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Anampses lineatus* Randall, 1972 – Lined tamarin

Taxonomy. First record from Réunion by LETOURNEUR (1992: 53); previously listed as *A. Cuvieri* (non Quoy & Gaimard, 1824) by GUICHENOT (1863: C28), and as *A. melanurus* (non Bleeker, 1857) by HARMELIN-VIVIEN (1976: 97).

Distribution. Réunion, Mauritius, Rodrigues, Seychelles. Marine species. Found in lagoon and seaward coral reefs, at depths of 10–42 m. Outside the area, Red Sea and East Africa south to Natal/South Africa, east to Maldives.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Very sensitive to human activities. Probable decline. Medium priority for conservation action.

*Anampses meleagrides* Valenciennes in Cuvier & Valenciennes, 1840 – Yellowtail tamarin

Taxonomy. First record from Réunion by HARMELIN-VIVIEN (1976: 97); record confirmed by FRICKE (1999: 393–394), based on MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles, Cargados Carajos. Marine species. Found in areas of mixed coral, rubble, consolidated limestone, and sand of seaward coral reefs, or in soft coral or sponge habitats, at depths of 3–60 m. Outside the area, Red Sea, East and South Africa east to Samoa and Tuamotu Archipelago, north to southern Japan and Ogasawara Islands, south to Lord Howe Island.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Anampses twistii* Bleeker, 1856 – Yellow-breasted wrasse

Taxonomy. First record from Réunion by HARMELIN-VIVIEN (1976: 97) as *A. twisti*.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Aldabra, Seychelles. Marine species. Found in clear lagoon and seaward coral reefs, usually in areas with mixed rubble, coral, or rock and sand, at depths of 5–30 m. Outside the area, East Africa east to Marshall Islands and Pitcairn, north to Ryukyu Islands, south to Western Australia, Chesterfield Islands and Rapa.

Conservation. Near threatened in Réunion (NT). Threats: HAB, EUT. Rare. Very sensitive to human activities. Probable decline. Medium priority for conservation action.

*Bodianus anthioides* (Bennett, 1832) – Lyretail hogfish
Taxonomy. First record from Réunion by Chabanet (1994: 240).
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Marine species. Found in coral and rocky reefs rich with invertebrates such as gorgonians, seawhips and black corals, common on steep outer slopes, at depths of 6–60 m. Outside the area, Red Sea, East and South Africa east to Wake and Marshall islands, and Henderson/Pitcairn Group, north to southern Japan, south to Western Australia, New Caledonia and Austral Islands.
Conservation. Vulnerable in Réunion (VU). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Bodianus axillaris* (Bennett, 1832) – Axilspot hogfish, turncoat hogfish
Taxonomy. First record from Réunion by Chabanet (1994: 240); previously listed as *B. albimaculatus* by Harmelin-Vivien (1976: 97).
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Found in clear lagoon and seaward coral and rocky reefs, at depths of 2–80 m. Outside the area, Red Sea, East and South Africa east to Line Islands and Pitcairn Group, north to southern Japan and Marshall Islands, south to Western Australia, Lord Howe Island and Rapa.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Bodianus bilunulatus* (Lacepède [ex Commerson], 1801) – Saddleback hogfish; Vieille à selle noire
Taxonomy. First record from Réunion by Guichenot (1863: C28) as *Cossyphus bilunulatus*; record confirmed by Fricke (1999: 396) as *Bodianus bilunulatus bilunulatus*, based on MHNRUN and MNHN material. Taxonomic decision of Gomon (2006: 77–79).
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Marine species. Found on deep coral and rocky reef slopes rich with invertebrates such as sponges and seawhips, but young adults occasionally seen much shallower; at depths of 8–120 m. Outside the area, East and South Africa east to Philippines, north to Ryukyu Islands, south to Houtman Abrolhos/Western Australia.
Conservation. Data deficient in Réunion (DD). Threats: FIB, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Bodianus bimaculatus* Allen, 1973 – Twospot hogfish; Labre à deux taches
Taxonomy. First record from Réunion by Letourneur et al. (2004: 205). Taxonomic decision of Gomon (2006: 24–26).
Distribution. Réunion, Mauritius, Madagascar. Marine species. Found around rubble and sand in steep outer coral reef slopes and drop-offs, usually adjacent to very deep water, at depths of 30–60 m. Outside the area, east to Palau/Belau and New Caledonia, north to southern Japan, south to northern New Zealand.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Bodianus diana* (Lacepède [ex Commerson], 1801) – Diana's hogfish; Labre diane
Taxonomy. First record from Réunion by Guichenot (1863: C13–C14, C28) as *Cossyphus diana* and *C. spilotes*; record confirmed by Fricke (1999: 397), based on MNHN material. Taxonomic decision of Gomon (2006: 56–59).
Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles. Marine species. Found in coral-rich areas of seaward coral reefs, at depths of 5–100 m. Outside the area, East and South Africa east to Nicobar and Cocos-Keeling Islands.
Conservation. Endangered in Réunion (EN). Threats: HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Bodianus leucosticticus* (Bennett, 1832) – Lined hogfish, fourline hogfish; Labre pointillé
Taxonomy. First record from Réunion by Randall in Smith & Heemstra (1986: 688); previously listed as *Cossyphus bodianus* (non Bloch, 1790) by Guichenot (1863: C28) as *C. rufus* (non Linnaeus, 1758) by Bleeker (1874: 82), and described as *Lepidaplois Bourboni* by Fourmanoir & Guézé (1961a: 7, fig. 1); record confirmed by Fricke (1999: 397–398), based on SAIAB material. Taxonomic decision of Gomon (2006: 49–52).
Distribution. Réunion, Mauritius. Marine species. Found in coral reefs. Outside the area, southern Japan to Taiwan.
Conservation. Endangered in Réunion (EN). Threats: HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Bodianus macrourus* (Lacepède [ex Commerson], 1801) – Mauritius hogfish, black-banded hogfish; Chien (Réunion), labre brassard (France)
Taxonomy. First record from Réunion by Bleeker (1874: 82) as *Cossyphus macrourus*; previously listed as *C. maldat* by Guichenot (1863: C28); subsequently listed as *Bodianus hirsutus* by Harmelin-Vivien (1976: 97); record confirmed by Fricke (1999: 398–399), based on MHNRUN and MNHN material. Taxonomic decision of Gomon (2006: 85–87).
Distribution. Réunion, Mauritius, Rodrigues, Cargados Carajos. Marine species. Found on exposed seaward coral reefs with sand patches, at depths of 10–40 m. Endemic to islands in the southwestern Indian Ocean.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Very sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Bodianus opercularis* (Guichenot, 1847) – Blackspot hogfish
Taxonomy. First record from Réunion by Guichenot (1863: C28) as *Cossyphus opercularis*.
Distribution. Réunion, Mauritius, Comores, Madagascar. Marine species. Found on rubble bottoms of steep outer coral reefs, at depths of 42–61 m. Outside the area, Red Sea and East Africa east to Christmas Island (eastern Indian Ocean).
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Very sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Bodianus perditio* (Quoy & Gaimard, 1834) – Goldspot hogfish, goldsaddle hogfish, golden-spot hogfish; Labre de la perdition
Taxonomy. First record from Réunion by Fourmanoir & Guézé (1961a: 7) as *Lepidaplois perditio*; previously listed as *Cossyphus atrolumbus* by Guichenot (1863: C28); record confirmed by Fricke (1999: 400), based on MNHN material. Taxonomic decision of Gomon (2006: 87–90).
Distribution. Réunion, Mauritius, Rodrigues, Cargados Carajos. Marine species. Found in the vicinity of coral and rocky reefs, often over sand or rubble, from 9 m depth (juveniles) to deeper water. Outside the area, anti-equatorial from South

Africa east to Tuamotu and Gambier islands, south to Western Australia, New South Wales/Australia, Lord Howe Island and Rapa, Taiwan north to southern Japan.
Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Cheilinus chlorourus* (Bloch, 1791) – Floral wrasse; Vieille tachetée
Taxonomy. First record from Réunion by Gomon (1984: 2 pp.).
Distribution. Réunion, Mauritius, Rodrigues, Aldabra, Seychelles, Cargados Carajos. Marine species. Found in lagoon and coastal coral reefs, in areas with mixed sand, rubble, and coral, at depths of 0–30 m. Outside the area, East and South Africa east to Wake, Marquesas and Gambier islands, north to southern Japan, south to Western Australia, Queensland/Australia, Elizabeth and Middleton reefs, and Rapa.
Conservation. Endangered in Réunion (EN). Threats: FIB, HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Cheilinus fasciatus* (Bloch, 1791) – Red-breasted wrasse; Vieille rayée
Taxonomy. First record from Réunion by Gomon (1984: 2 pp.) as *C. fasciatus fasciatus*.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Marine species. Found in lagoon and seaward coral or rocky reefs, usually in areas with mixed coral, sand, and rubble, at depths of 3–60 m. Outside the area, Red Sea and East Africa east to Wake and Marshall islands, Samoa and Tonga, south to Western Australia, Queensland/Australia and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: FIB, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Cheilinus oxycephalus* Bleeker, 1853 – Snooty wrasse; Vieille à bec pointu
Taxonomy. First record from Réunion by Fricke (1999: 402), based on USNM material.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Marine species. Found in coral-rich areas of lagoon and seaward coral reefs, at depths of 1–40 m. Outside the area, East and South Africa east to Marquesas and Gambier islands, north to southern Japan, south to Western Australia, Queensland/Australia and Austral Islands.
Conservation. Endangered in Réunion (EN). Threats: HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action. Proposed for Annex II of the EU Habitats Directive.

*Cheilinus trilobatus* Lacepède [ex Commerson], 1801 – Tripletail wrasse; Lachaux (Réunion), vieille triple queue, vieille trilobé (France)
Taxonomy. Originally described from Réunion by Lacepède (1801: 529, 537–538, pl. 31, fig. 3); subsequently listed as *C. lunulatus* (non Forsskål in Niebuhr, 1775) by Guichenot (1863: C28); record confirmed by Fricke (1999: 402–403), based on LEMUR, MHNRUN, MNHN and SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles. Marine species. Found along shallow reef margins with good coral cover, at depths of 1–30 m. Outside the area, East and South Africa east to Wake and Gambier islands, north to southern Japan, south to Western Australia, New Caledonia and Austral Islands.
Conservation. Endangered in Réunion (EN). Threats: FIB, HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Cheilinus undulatus* Rüppell, 1835 – Humphead wrasse; Napoléon
Taxonomy. First record from Réunion by Gomon (1984: 2 unnumbered pp.).
Distribution. Réunion, Mauritius, Comores, Madagascar, Aldabra. Marine species. Found on steep outer reef slopes, channel slopes, and lagoon reefs; juveniles are encountered in coral-rich areas of lagoon reefs, where staghorn *Acropora* corals abound; also in algal reefs or seagrass; adults rove across the reefs by day and rest in reef caves and under coral ledges at night; at depths of 1–60 m. Outside the area, Red Sea and East Africa east to Tuamotu Archipelago, north to Ryukyu Islands, south to New Caledonia.
Conservation. Critically endangered in Réunion (CR). Threats: FIT, HAB, EUT. Very sensitive to human activities. Keystone species. Severe decline. High priority for conservation action.

*Cheilio inermis* (Forsskål in Niebuhr, 1775) – Cigar wrasse; Banane (Réunion), longue girelle (France)
Taxonomy. First record from Réunion by Bleeker (1874: 83); subsequently listed as *Chelio cyano-chloris* and *C. auratus* by Guichenot (1863: C28); record confirmed by Fricke (1999: 404–405), based on LEMUR, MHNRUN and MNHN material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles. Marine species. Found in seagrass beds and algal-covered flats, adjacent to lagoon and seaward coral reefs, at depths of 1–30 m. Outside the area, Red Sea, East and South Africa east to Hawaiian and Easter islands, north to southern Japan, south to Western Australia, New South Wales/Australia, Lord Howe Island, and Rapa.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Choerodon robustus* (Günther, 1862) – Robust tuskfish; Chien, lachaux (Réunion), maldaque robuste (France)
Taxonomy. First record from Réunion by Gomon (1984: 2 pp.); previously described as *Cossyphus maxillosus* by Guichenot (1863: C28), and as *Choerops dodecacanthus* by Bleeker (1868b: 275–277); record of *Choerodon robustus* confirmed by Fricke (1999: 405–406), based on MNHN material.
Distribution. Réunion, Mauritius, Seychelles. Marine species. Found on deeper coral and rocky reefs, at depths of 40–70 m. Outside the area, Red Sea, East and South Africa, Indonesia, southern Japan.
Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Coris aygula* Lacepède [ex Commerson], 1801 – Clown coris; Loupe côte (Réunion), clarisse clown (France)
Taxonomy. First record from Réunion by Bleeker (1874: 83); previously listed as *Julis Coris* by Guichenot (1863: C28); record of *Coris aygula* confirmed by Fricke (1999: 407–408), based on MHNRUN, MNHN, SMNS and USNM material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles, Cargados Carajos. Marine species. Found in the vicinity of sand or rubble patches of exposed outer reef flats, lagoon reefs, and seaward coral reefs,

often in semi-exposed surge zones, juveniles common in shallow tide pools; at depths of 0–30 m. Outside the area, Red Sea, East and South Africa east to Wake and Line islands, and Pitcairn Group, north to southern Japan and Ogasawara Islands, south to northwestern Australia, New South Wales/Australia, Lord Howe Island and Rapa.

Conservation. Data deficient in Réunion (DD). Threats: FIB, HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Coris caudimacula* (Quoy & Gaimard, 1834) – Spottail coris; Girelle à tache caudale

Taxonomy. First record from Réunion by Bleeker (1873a: 98–100) as *Hemicoris caudimacula*.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles, Cargados Carajos. Marine species. Found in sandy or algal-rich areas near coral or rocky reefs or in seagrass beds, at depths of 0–57 m. Outside the area, Red Sea, East Africa and eastern South Africa east to western Indonesia and northwestern Australia, south to Shark Bay/Western Australia.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Coris cuvieri* (Bennett, 1831) – African coris; Clarisse africaine

Taxonomy. **New record** from Réunion; previously listed as *C. Gaimard* (non Quoy & Gaimard, 1824) by Fourmanoir & Guézé (1961a: 14), and as *C. africana* by Letourneur (1991: 164); record confirmed by Fricke (1999: 406), based on LEMUR and USNM material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles. Marine species. Found in exposed outer reef flats and lagoon and seaward coral or rocky reefs, in areas of mixed sand, coral and rubble, at depths of 1–20 m; juveniles occur in small tide pools, exposed reef flats with algae-rubble. Outside the area, Red Sea, East and South Africa east to Andaman Sea.

Conservation. Data deficient in Réunion (DD). Threats: FIB, HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Coris frerei* (Günther in Playfair & Günther, 1867) – Queen coris; Girelle reine

Taxonomy. **New record** from Réunion; previously listed as *C. formosa* by Gomon (1984: 2 unnumbered pp.); record confirmed by Fricke (1999: 409–410) as *C. formosa*.

Distribution. Réunion, Mauritius, Comores, Madagascar, Aldabra, Seychelles, Cargados Carajos. Marine species. Adults found in seagrass, rock and coral areas; juveniles in shallow tide pools. Outside the area, Red Sea, East Africa and Natal/South Africa east to Sri Lanka.

Conservation. Data deficient in Réunion (DD). Threats: FIB, HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Cymolutes praetextatus* (Quoy & Gaimard, 1834) – Knife wrasse, knife razorfish

Taxonomy. First record from Réunion by Letourneur (1992: 40, 99, unpag. 5).

Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Found on reef flats and in shallow lagoons, in sandy, current-swept areas with rubble and seagrass, at depths of 1–6 m. Outside the area, South and East Africa east to Society Islands, north to Mariana Islands, south to Rowley Shoals/Western Australia, Norfolk Island and Tonga.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Epibulus insidiator* (Pallas, 1770) – Slingjaw wrasse; Epibule gourami

Taxonomy. First record from Réunion by Gomon (1984: 2 unnumbered pp.); record confirmed by Fricke (1999: 410–411), based on LEMUR material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles, Cargados Carajos. Marine species. Found in coral-rich areas of lagoon and seaward reefs, at depths of 9–42 m. Outside the area, Red Sea, East and South Africa east to Hawaiian and Gambier islands, north to southern Japan, south to Western Australia, Queensland/Australia, New Caledonia and Tonga.

Conservation. Endangered in Réunion (EN). Threats: HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Gomphosus caeruleus* Lacepède [ex Commerson], 1801 – Indian Ocean bird wrasse, birdfish; Poisson oiseau

Taxonomy. First record from Réunion by Valenciennes in Cuvier & Valenciennes (1840: 29–32); subsequently listed as *G. fuscus* by Guichenot (1863: C28), and as *G. varius* (non Lacepède, 1801) by Bleeker (1874: 82); record confirmed by Fricke (1999: 411–412), based on LEMUR, MHNRUN, MNHN and SMNS material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles. Marine species. Found in coral-rich areas of lagoon and seaward reefs, and in rocky reefs, at depths of 0–15 m. Outside the area, Red Sea, East and South Africa east to Andaman Sea.

Conservation. Endangered in Réunion (EN). Threats: HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action.

*Halichoeres cosmetus* Randall & Smith, 1982 – Adorned wrasse; Girelle à raies d'or

Taxonomy. First record from Réunion by Randall & Smith (1982: 15–17); record confirmed by Fricke (1999: 412–413), based on MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Seychelles. Marine species. Found on coral and rocky reefs, at depths of 1–31 m. Outside the area, East Africa and Natal/South Africa east to Maldives and Chagos Archipelago.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Halichoeres hortulanus* (Lacepède [ex Commerson], 1801) – Checkerboard wrasse; Bonpartère (Réunion), lalo damier (France)

Taxonomy. First record from Réunion by Guichenot (1863: C28) as *Julis hortulanus*; previously described as *Labrus centiquadrus* by Lacepède (1801: 437–438, 492–500).

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Found on sand patches of lagoon and seaward coral reefs, also on slopes to moderate depths along drop-offs, juveniles at the bottom of surge channels; at depths of 0–30 m. Outside the area, Red Sea and East Africa east to Tuamotu Archipelago, north to southern Japan and Ogasawara Islands, south to Rowley Shoals/Western Australia, New South Wales/Australia, New Caledonia and Tonga.

Conservation. Endangered in Réunion (EN). Threats: HAB,

EUT. Rare. Very sensitive to human activities. Significant decline. High priority for conservation action.

*Halichoeres iridis* Randall & Smith, 1982 – Rainbow wrasse
Taxonomy. First record from Réunion by Fricke (1999: 414–415), based on an underwater photograph taken by J. Caratini.
Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Found in steep seaward coral reefs, in sand and rubble areas, at depths of 6–43 m. Outside the area, Yemen/southern Red Sea, East and South Africa.
Conservation. Endangered in Réunion (EN). Threats: HAB, EUT. Rare. Very sensitive to human activities. Significant decline. High priority for conservation action.

*Halichoeres lamarii* Valenciennes in Cuvier & Valenciennes, 1839 – Indian Ocean dusky wrasse; Girelle arc-en-ciel
Taxonomy. **New record** from Réunion; previously listed as *H. marginatus* (non Rüppell, 1835) by Randall & Smith (1982: 5–6), and described as *H. virescens* by Fourmanoir & Guézé (1961a: 13); record confirmed by Fricke (1999: 415–416) as *H. marginatus* (non Rüppell, 1835), based on LEMUR, MNHN, SMNS and USNM material.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles, Cargados Carajos. Marine species. Found on lagoon and seaward reefs, along the upper edges of coral-rich areas, juveniles are encountered in exposed outer reef flats; at depths of 0–20 m. Outside the area, East Africa east to Maldives and Chagos Archipelago.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Very sensitive to human activities. Probable decline. Medium priority for conservation action.

*Halichoeres lapillus* Smith, 1947 – Jewelled wrasse; Girelle à petits cailloux
Taxonomy. First record from Réunion by Chabanet (1994: 241).
Distribution. Réunion, Mauritius, Madagascar. Marine species. Found on rocky bottoms or coral reefs rich in algae, at depths of 5–15 m. Outside the area, Oman south to Natal/South Africa.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Halichoeres nebulosus* (Valenciennes in Cuvier & Valenciennes, 1839) – Nebulous wrasse, picture wrasse; Girelle nebuleuse
Taxonomy. First record from Réunion by Letourneur (1991: 164); previously listed as *H. kawarin* (non Bleeker, 1852) and as *H. melanurus* (non Bleeker, 1851) by Harmelin-Vivien (1976: 97, 98); record confirmed by Fricke (1999: 417), based on LEMUR material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Marine species. Found in seagrass areas of reef flats, along reef margins and rocky shores, at depths of 0–40 m. Outside the area, Red Sea, East and South Africa east to Papua New Guinea, north to southern Japan, south to Queensland/Australia.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Halichoeres scapularis* (Bennett, 1832) – Zigzag wrasse; Girelle en arc-en-ciel
Taxonomy. First record from Réunion by Bleeker (1874: 83) as *Güntheria scapularis*; previously described as *Julis Leschenaulti* by Valenciennes in Cuvier & Valenciennes (1839: 453–454); record confirmed by Fricke (1999: 418), based on LEMUR, MNHN and SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles, Cargados Carajos. Marine species. Found in shallow lagoons or bays, usually over sand, rubble, or seagrass bottom, rather than on coral reef, at depths of 1–10 m. Outside the area, Red Sea and East Africa east to New Guinea, north to southern Japan, south to Western Australia, Queensland/Australia, and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Hemigymnus fasciatus* (Bloch, 1792) – Barred thicklip wrasse; Chien noir (Réunion), tamarin à bandes noires (France)
Taxonomy. First record from Réunion by Bleeker (1874: 82); record confirmed by Fricke (1999: 419–420), based on MNHN material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles, Cargados Carajos. Marine species. Found on coral reefs and reef flats, at depths of 0–20 m. Outside the area, Red Sea, East and South Africa east to Wake Atoll and Pitcairn Group, north to southern Japan, south to Western Australia, New South Wales/Australia, Lord Howe Island and Rapa.
Conservation. Endangered in Réunion (EN). Threats: FIT, HAB, EUT. Rare. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Hemigymnus melapterus* (Bloch, 1791) – Blackedge thicklip wrasse; Tamarin vert
Taxonomy. First record from Réunion by Gomon (1984: 2 unnumbered pp.); record needs verification.
Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Found on subtidal reef flats, lagoon and seaward reefs, among branching corals while adults found in areas of mixed sand, rubble, and coral, at depths of 0–30 m. Outside the area, East Africa east to Marshall and Society islands, north to southern Japan, south to Western Australia, New South Wales/Australia, Lord Howe Island and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Very sensitive to human activities. Keystone species. Probable decline. High priority for conservation action.

*Hologymnosus annulatus* (Lacepède [ex Commerson], 1801) – Ring wrasse; Labre annelé
Taxonomy. First record from Réunion by Guichenot (1863: C28) as *Julis annulatus*; subsequently listed as *Hologymnosus semidiscus* by Fourmanoir & Guézé (1961a: 14).
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Found on coral reefs and rocky substrates, at depths of 2–30 m. Outside the area, Red Sea and East Africa east to Pitcairn, north to southern Japan, south to Western Australia, Victoria/Australia, and Rapa.
Conservation. Data deficient in Réunion (DD). Threats: FIB, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Hologymnosus doliatus* (Lacepède [ex Commerson], 1801) – Longface wrasse, ringed wrasse, pastel wrasse; Tongole (Réunion), colombine pastel (France)
Taxonomy. First record from Réunion by Guichenot (1863: C28) as *Julis doliatus*; subsequently listed as *Hologymnosus fasciatus* by Bleeker (1874: 83, part), and as *H. oxyrhynchus* by

HARMELIN-VIVIEN (1976: 98); record confirmed by FRICKE (1999: 421–422).

Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Found on coral reefs and rocky substrates, at depths of 2–30 m. Outside the area, Red Sea and East Africa east to Pitcairn, north to southern Japan, south to Victoria/Australia, and Rapa.

Conservation. Data deficient in Réunion (DD). Threats: FIB, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Iniistius pavo* (Valenciennes in Cuvier & Valenciennes, 1840) – Indianfish (juvenile), blue razorfish (adult), peacock wrasse; Vieux monde (Réunion), rason paon (France)

Taxonomy. Originally described from Réunion (in part) by VALENCIENNES in CUVIER & VALENCIENNES (1840: 61–63, pl. 394) as *Xyrichthys pavo*; subsequently listed as *Julis vittatus* (non Valenciennes in Cuvier & Valenciennes, 1840) by GUICHENOT (1863: C28); record confirmed by FRICKE (1999: 447–448) as *Xyrichtys pavo*, based on MNHN material.

Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles. Transitional water and marine. Usually found solitary in lagoon and seaward reef areas with fine to loose, coarse sand bottoms (dives into the sand when threatened); juveniles sometimes in shallow estuaries; adults rare in less than 20 m; at depths of 1–100 m. Outside the area, Red Sea, East Africa and Natal/South Africa east to Mexico, north to southern Japan, Ogasawara and Hawaiian islands, south to Lord Howe and Society islands.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Labrichthys unilineatus* (Guichenot, 1847) – Tubelip wrasse

Taxonomy. First record from Réunion by FRICKE (1999: 422); previously listed as *L. cyanotaenia* by HARMELIN-VIVIEN (1976: 98).

Distribution. Réunion, Mauritius, Aldabra. Marine species. Found in lagoon and semi-protected seaward coral reefs with high coral cover, near branching corals, particularly staghorn *Acropora*; feeds on coral polyps, at depths of 0–20 m. Outside the area, East Africa east to Society Islands, south to Western Australia, Lord Howe Island and Tonga.

Conservation. Endangered in Réunion (EN). Threats: PRL, HAB, EUT. Rare. Very sensitive to human activities. Significant decline. High priority for conservation action.

*Labroides bicolor* Fowler & Bean, 1928 – Bicoloured cleaner wrasse; Poisson nettoyeur bicolore

Taxonomy. First record from Réunion by HARMELIN-VIVIEN (1976: 98) as *Labroides bicolor* and *Fowlerella bicolor*.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar. Marine species. Found in lagoon and seaward coral or rocky reefs, territorial around prominent coral or rock formations called 'cleaning stations', at depths of 0–40 m. Outside the area, Natal/South Africa and East Africa east to Wake Atoll and Pitcairn Group, north to southern Japan and Ogasawara Islands, south to Western Australia, Lord Howe and Austral islands.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Labroides dimidiatus* (Valenciennes in Cuvier & Valenciennes, 1839) – Bluestreak cleaner wrasse; Poisson nettoyeur commun

Taxonomy. First record from Réunion by HARMELIN-VIVIEN (1976: 98); record confirmed by FRICKE (1999: 423), based on LEMUR and SMNS material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles. Marine species. Found in coral-rich areas of inner lagoons and subtidal reef flats to seaward coral or rocky reefs, at depths of 1–40 m. Outside the area, Red Sea, East and South Africa east to Wake Atoll and Pitcairn Group, north to southern Japan, south to Western Australia, Lord Howe Island and Rapa.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Labropsis xanthonota* Randall, 1981 – Wedge-tailed wrasse

Taxonomy. First record from Réunion by CHABANET (1994: 241); record confirmed by FRICKE (1999: 424), based on SAIAB material.

Distribution. Réunion, Mauritius, Seychelles. Marine species. Found in coral-rich areas of clear outer lagoon and seaward reefs, feeds on coral polyps, at depths of 7–55 m. Outside the area, East Africa east to Micronesia, Samoa and Tonga, south to Western Australia and Loyalty Islands.

Conservation. Endangered in Réunion (EN). Threats: PRL, HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action.

*Macropharyngodon bipartitus* Smith, 1957 – Vermiculate wrasse, divided wrasse; Girelle diamant

Taxonomy. First record from Réunion by LETOURNEUR (1992: 40); record confirmed by FRICKE (1999: 424) as *M. bipartitus bipartitus*, based on BPBM material.

Distribution. Réunion, Mauritius, Rodrigues, Aldabra, Seychelles. Marine species. Found in lagoon and sheltered seaward coral or rocky reefs, at depths of 1–30 m. Outside the area, East Africa east to Maldives and Chagos Archipelago.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Macropharyngodon cyanoguttatus* Randall, 1978 – Indian Ocean black-spotted wrasse

Taxonomy. First record from Réunion by RANDALL in SMITH & HEEMSTRA (1986: 699); record confirmed by FRICKE (1999: 424–425), based on BPBM material.

Distribution. Réunion, Mauritius. Marine species. Found in coral reefs, at depths of 10–40 m. Outside the area, Natal/South Africa.

Conservation. Endangered in Réunion (EN). Threats: HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action.

*Novaculichthys taeniourus* (Lacepède [ex Commerson], 1801) – Dragon wrasse, rockmover wrasse; Rason algue

Taxonomy. First record from Réunion as *N. taeniurus* by FOURMANOIR & GUÉZÉ (1961a: 15–16, fig. 5); record confirmed by FRICKE (1999: 425–426), based on LEMUR material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles. Marine species. Found in semi-exposed reef flats and lagoon and seaward coral reefs; common in areas of mixed sand, and rubble that are subject to mild surge; juveniles shallow on rubble amongst large bommies or protected open patches on reef crests and swim as if were a leaf floating along the bottom; large adults move along over large reef section, usually in pairs and typically turn or shift large pieces of rubble or debris; at depths of 3–25 m. Outside the area, Red Sea, East and Natal/South

Africa east to Panama, north to southern Japan and Hawaiian Islands, south to Lord Howe and Tuamotu islands.
Conservation. Vulnerable in Réunion (VU). Threats: HAB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Oxycheilinus arenatus* Valenciennes in Cuvier & Valenciennes, 1840 – Speckled maori wrasse; Vieille maori pointillée
Taxonomy. Originally described from Réunion as *Cheilinus arenatus* by Valenciennes in Cuvier & Valenciennes (1840: 101–102, pl. 397); record confirmed by Fricke (1999: 426), based on MNHN material.
Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Found in caves of steep outer coral reef drop-offs with rich invertebrate growth such as large gorgonians or soft corals, at depths of 25–46 m. Outside the area, Red Sea and East Africa east to Marshall Islands and Samoa, north to Philippines and Mariana Islands.
Conservation. Data deficient in Réunion (DD). Threats: PRL, HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Oxycheilinus bimaculatus* (Valenciennes in Cuvier & Valenciennes, 1840) – Twospot wrasse; Labre à queue de comète
Taxonomy. **New record** from Réunion, based on a specimen collected during a visual census, near La Possession, at 15 m depth, in 2006 (T. Mulochau, P. Durville).
Distribution. Réunion, Mauritius, Madagascar, Aldabra, Seychelles. Marine species. Found on outer reef slopes or deep clear lagoons among rubble or clumps of algae, also in seagrass beds, including estuaries, at depths of 1–110 m. Outside the area, East Africa east to Hawaiian Islands, south to Lord Howe Island.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Low priority for conservation action.

*Oxycheilinus digrammus* (Lacepède [ex Commerson], 1801) – Cheek-lined wrasse, bandcheek wrasse; Vieille barbe noire
Taxonomy. First record from Réunion by Guichenot (1863: C28) as *Cheilinus diagrammus*; subsequently listed by Bleeker (1874: 84) as *C. radiatus*; record confirmed by Fricke (1999: 427), based on MHNRUN material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Marine species. Found in lagoon and sheltered seaward coral reefs in coral-rich areas, at depths of 3–50 m, possibly deeper; juveniles more inshore on sheltered reef crests or slopes, usually amongst soft corals or stinging hydrozoans. Outside the area, Red Sea, East Africa and Natal/South Africa east to Wake and Gambier islands, north to Ryukyu Islands, south to New Caledonia and Tonga.
Conservation. Endangered in Réunion (EN). Threats: PRL, HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Pseudocheilinus dispilus* Randall, 1999 – Mascarene sixstripe wrasse
Taxonomy. Originally described from Réunion by Randall (1999: 10, fig. 1, pl. 1 B); previously listed as *P. hexataenia* (non Bleeker, 1857) by Harmelin-Vivien (1976: 98), and by Fricke (1999: 427–428) as *P. evanidus* (non Jordan & Evermann, 1903), based on SMNS material.
Distribution. Réunion, Mauritius, Madagascar. Marine species. Found in seaward coral reefs among coral branches, also in clear coastal waters, dense coral habitats on shallow reef crest or slopes, at depths of 0–37 m. Endemic to islands in the southwestern Indian Ocean.
Conservation. Endangered in Réunion (EN). Threats: HOS, HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action.

*Pseudocheilinus octotaenia* Jenkins, 1901 – Eightstripe wrasse, eightline wrasse
Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 98).
Distribution. Réunion, Mauritius, Comores, Madagascar, Aldabra, Cargados Carajos. Marine species. Found among rubble or live corals of seaward coral reefs, usually in caves and crevices with rich invertebrate growth; at depths of 2–50 m. Outside the area, Red Sea, East Africa and Natal/South Africa east to Hawaiian and Ducie islands, north to Yaeyama and Ogasawara islands, south to Tonga and Austral Islands.
Conservation. Endangered in Réunion (EN). Threats: HOS, HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action.

*Pseudocoris yamashiroi* (Schmidt, 1931) – Redspot wrasse
Taxonomy. **New record** from Réunion, based on specimens observed during a visual census, on the outer coral reef, in 2004 (T. Mulochau, P. Durville, E. Tessier, P. Chabanet).
Distribution. Réunion, Mauritius. Marine species. Found in lagoons and coral reefs, often on open sand flats with large remote bommies, at depths of 5–25 m. Outside the area, East Africa east to Marshall and Samoan islands, north to southern Japan, south to Kermadec Islands.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Pseudodax moluccanus* (Valenciennes in Cuvier & Valenciennes, 1840) – Chiseltooth wrasse; Vieille ciseau
Taxonomy. First record from Réunion by Guichenot (1863: C28) as *Pseudodax Mollucanus*; previously described as *Odax Borbonicus* by Valenciennes in Cuvier & Valenciennes (1840: 306–307) [both Fricke (1999: 429; 10 September 1999) and Randall & Parenti (1999: 31; 6 December 1999) acted as first reviewers to choose *Odax moluccanus* as the senior synonym over *O. borbonicus*]; record confirmed by Fricke (1999: 429), based on MNHN material.
Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Found in clear channels and seaward coral reefs; juveniles common along drop-offs below 18 m; adults usually near caves while juveniles frequently live inside them; at depths of 3–60 m. Outside the area, Red Sea, East Africa and Natal/South Africa east to Marquesas and Tuamotu islands, north to southern Japan and Ogasawara Islands, south to New Caledonia and Tonga.
Conservation. Endangered in Réunion (EN). Threats: HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action.

*Pteragogus pelycus* Randall, 1981 – Sideburn wrasse
Taxonomy. First record from Réunion by Fricke (1999: 430–431); previously listed as *Pteragogus opercularis* by Bleeker (1874: 81).
Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Found in quiet seagrass beds and algal flats adjacent to coral reefs, at depths of 1–25 m. Outside the area, Red Sea and East Africa.
Conservation. Data deficient in Réunion (DD). Threats: HAB,

EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Stethojulis albovittata* (Bonnaterre [ex Koelreuther], 1788) – Blue-lined wrasse

Taxonomy. First record from Réunion by BLEEKER (1874: 82); previously listed as *Julis balteatus* (non Quoy & Gaimard, 1824) and *J. axillaris* (non Quoy & Gaimard, 1824) by GUICHENOT (1863: C28); record confirmed by FRICKE (1999: 431–432), based on BPBM, LEMUR, MHNRUN, MNHN, SMNS and USNM material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles, Cargados Carajos. Marine species. Found in reef flats and clear lagoon and seaward coral and rocky reefs, at depths of 0–10 m. Outside the area, Red Sea, East Africa and Natal/South Africa east to Maldives and Chagos Archipelago, possibly Sri Lanka.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Stethojulis strigiventer* (Bennett, 1832) – Threeribbon wrasse

Taxonomy. First record from Réunion by HARMELIN-VIVIEN (1976: 98); record confirmed by FRICKE (1999: 432–433), based on USNM material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles, Cargados Carajos. Marine species. Found in seagrass beds and areas of mixed sand, rubble, and algae of inner coral reef flats and shallow lagoons, at depths of 1–15 m. Outside the area, East Africa east to Marshall, Tuamotu and Gambier islands, north to southern Japan, south to New Caledonia, Tonga and Austral Islands.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Thalassoma amblycephalum* (Bleeker, 1856) – Twotone wrasse

Taxonomy. First record from Réunion by HARMELIN-VIVIEN (1976: 98) as *T. amblycephalus*; subsequently listed as *T. melanochir* by FOURMANOIR & GUÉZÉ (1961a: 11); record confirmed by FRICKE (1999: 433–434), based on LEMUR and SMNS material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles, Cargados Carajos. Marine species. Found in aggregations over shallow lagoon and seaward coral and rocky reefs and on reef flats, at depths of 0–15 m. Outside the area, Transkei/South Africa and East Africa east to Line, Marquesas and Tuamotu islands, north to southern Japan and Ogasawara Islands, south to Lord Howe Island, northern New Zealand and Tonga.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Thalassoma genivittatum* (Valenciennes in Cuvier & Valenciennes, 1839) – Redcheek wrasse

Taxonomy. First record from Réunion by LETOURNEUR (1991: 164); previously listed as *Julis Commersonii* by GUICHENOT (1863: C28); subsequently described as *Thalassoma mascarenum* by FRICKE (1999: 437–444, figs. 6A, 7A), based on MNHN and SMNS material; record confirmed by FRICKE (1999: 434–435) as *T. genivittatum*, based on USNM material.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Marine species. Found in small groups above rocky reefs with little coral cover, at depths of 0–10 m. Outside the area, Natal/South Africa.

Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Thalassoma hardwicke* (Bennett, 1830) – Sixbar wrasse; Girelle à six bandes

Taxonomy. First record from Réunion by HARMELIN-VIVIEN (1976: 98); record confirmed by FRICKE (1999: 435–436), based on LEMUR and SMNS material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles. Marine species. Found in small groups on coral reefs, at depths of 0–15 m. Outside the area, South and East Africa east to Wake and Tuamotu islands, north to southern Japan and Ogasawara Islands, south to Lord Howe, Tongan and Austral islands.

Conservation. Endangered in Réunion (EN). Threats: HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action. Proposed for Annex II of the EU Habitats Directive.

*Thalassoma hebraicum* (Lacepède [ex Commerson], 1801) – Goldbar wrasse

Taxonomy. First record from Réunion by BLEEKER (1874: 82, part) as *Julis hebraica*; listed by FRICKE (1999: 445) as *Thalassoma quinquevittatum* (non Lay & Bennett, 1839), based on USNM material; record of *T. hebraicum* confirmed by FRICKE (1999: 436–437), based on MNHN material.

Distribution. Réunion, Mauritius, Comores, Madagascar, Aldabra, Seychelles, Cargados Carajos. Marine species. Found in lagoon and seaward coral reefs, usually on patch reefs or rocks, at depths of 1–30 m. Outside the area, Red Sea and East Africa east to Maldives and Chagos Archipelago.

Conservation. Vulnerable in Réunion (VU). Threats: HAB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Thalassoma purpureum* (Forsskål in Niebuhr, 1775) – Surge wrasse; Girelle hublot

Taxonomy. First record from Réunion by BLANC & POSTEL (1958: 369, 373); previously listed as *Julis umbrostigma* by PLAYFAIR & GÜNTHER (1867: XI); record confirmed by FRICKE (1999: 444–445), based on MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar. Marine species. Found almost exclusively in the surge zone of outer reef flats, coral reef margins, and rocky coastline, at depths of 0–10 m. Outside the area, Red Sea and East Africa east to Hawaiian, Marquesas and Easter islands, north to southern Japan and Ogasawara Islands, south to Lord Howe and Kermadec islands.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Thalassoma trilobatum* (Lacepède [ex Commerson], 1801) – Ladder wrasse, Christmas wrasse; Calonnier côte (Réunion), girelle de Noël (France)

Taxonomy. First record from Réunion by GUICHENOT (1863: C28) as *Julis trilobatus*; previously described as *Labrus fuscus* by LACEPÈDE (1801: 437, 492–500), and listed as *Julis formosus*, *J. aeruginosus* and *J. Souleyeti* by GUICHENOT (1863: C28); record confirmed by FRICKE (1999: 446–447), based on MNHN and SMNS material.

Distribution. Réunion, Mauritius, Seychelles. Marine species. Found in shallow exposed reef flats, usually with rock-base and mixed coral and algae, also in surge-swept reef flats, coral reef margins, and clear rocky shorelines, at depths of 0–10 m. Outside the area, Transkei/South Africa and East

Africa east to Wake Atoll and Pitcairn Group, north to Ryukyu and Ogasawara islands, south to Kermadec Islands and Tonga.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Xyrichtys pentadactylus* (Linnaeus, 1758) – Fingerprint razorfish; Rason ocellé

Taxonomy. First record from Réunion by Gomon (1984: 2 unnumbered pp); record confirmed by Fricke (1999: 448–449), based on MHNRUN material.

Distribution. Réunion, Mauritius, Comores, Madagascar. Marine species. Found over sandy bottoms, and in areas with some seagrass or algae, at depths of 1–18 m. Outside the area, Red Sea and East Africa east to Philippines, north to Taiwan and Ogasawara Islands, south to Queensland/Australia.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

## Scaridae – Parrotfishes

*Calotomus carolinus* (Valenciennes in Cuvier & Valenciennes, 1840) – Stareye parrotfish, Christmas parrotfish, bucktooth parrotfish; Perroquet des Carolines

Taxonomy. First record from Réunion by Bruce & Randall (1984: 2 unnumbered pp); previously described as *Cryptotomus albimarginatus*, and listed as *C. spinidens* (non Quoy & Gaimard, 1824), by Fourmanoir & Guézé (1961a: 18, 19, fig. 6).

Distribution. Réunion, Mauritius, Comores, Madagascar, Aldabra, Amirantes, Farquhar Islands, Seychelles. Marine species. Found over subtidal reef flats, and lagoon and seaward coral reefs, in coral, rubble and seagrass areas, at depths of 0–27 m. Outside the area, East and South Africa east to Hawaiian Islands and Pitcairn, north to Ryukyu and Ogasawara islands, south to Western Australia, New Caledonia, and Tonga.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, PRL, HAB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Cetoscarus ocellatus* (Valenciennes in Cuvier & Valenciennes, 1840) – Bicoloured parrotfish; Perroquet à points rouges

Taxonomy. **New record** from Réunion; previously listed as *C. bicolor* (non Rüppell, 1829) by Bruce & Randall (1984: 2 unnumbered pp).

Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Found in clear lagoon and seaward coral reefs, at depths of 0–30 m. Outside the area, East Africa east to Caroline and Gambier islands, south to Western Australia, New Caledonia, and Tonga.

Conservation. Endangered in Réunion (EN). Threats: FIT, PRL, HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Chlorurus enneacanthus* (Lacepède, 1802) – Green parrotfish, captain parrotfish; Perroquet (Réunion), perroquet capitaine (France)

Taxonomy. First record from Réunion as *Scarus enneacanthus* by Bruce & Randall (1984: 2 unnumbered pp); previously listed as *S. capitanus* by Guichenot (1863: C28); record confirmed by Fricke (1999: 451–452), based on MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Seychelles. Marine species. Found on shallow fringing coral reefs, usually in areas with dead coral and rubble, at depths of 0–10 m. Outside the area, Mozambique east to Maldives and Chagos Archipelago.

Conservation. Data deficient in Réunion (DD). Threats: FIT, PRL, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Chlorurus japanensis* (Bloch, 1789) – Pale bullethead parrotfish; Perroquet à joue pale

Taxonomy. First record from Réunion as *Scarus japanensis* by Bruce & Randall (1984: 2 unnumbered pp); previously listed as *S. Blochii* by Guichenot (1863: C28), and as *Pseudoscarus viridis* by Playfair & Günther (1867: XII); record confirmed by Fricke (1999: 452), based on MHNRUN and MNHN material.

Distribution. Réunion, Mauritius. Marine species. Found on seaward coral and rocky reefs, usually on inner reefs with rich coral habitat, at depths of 1–20 m. Outside the area, East Africa east to Tonga, north to Ryukyu Islands, south to Queensland/Australia.

Conservation. Data deficient in Réunion (DD). Threats: FIT, PRL, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Chlorurus sordidus* (Forsskål in Niebuhr, 1775) – Bullethead parrotfish, daisy parrotfish; Perroquet marguerite

Taxonomy. First record from Réunion as *Scarus sordidus* by Bruce & Randall (1984: 2 unnumbered pp); record confirmed by Fricke (1999: 453–454), based on LEMUR and MHNRUN material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Amirantes, Seychelles. Marine species. Found in both coral-rich and open pavement areas of shallow reef flats and lagoon and seaward coral and rocky reefs, as well as along drop-offs; juveniles in coral rubble areas of reef flats and lagoons; at depths of 1–50 m. Outside the area, Red Sea, East and South Africa east to Hawaiian Islands and Pitcairn Group, north to Ryukyu and Ogasawara islands, south to Western Australia, Lord Howe Island and Rapa.

Conservation. Data deficient in Réunion (DD). Threats: FIT, PRL, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Chlorurus strongylocephalus* (Bleeker, 1854) – Steephead parrotfish; Perroquet vert (Réunion)

Taxonomy. First record from Réunion by Fricke (1999: 454), based on SMNS material; previously listed as *Pseudoscarus striatus* (non Valenciennes in Cuvier & Valenciennes, 1839) by Playfair & Günther (1867: XII), and as *Scarus gibbus* (non Rüppell, 1829) by Bruce & Randall (1984: 2 unnumbered pp.).

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Marine species. Found in lagoon and seaward coral reefs, at depths of 1–35 m. Outside the area, East Africa east to southwestern Indonesia, north to Andaman Sea.

Conservation. Endangered in Réunion (EN). Threats: FIT, PRL, HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Hipposcarus harid* (Forsskål in Niebuhr, 1775) – Candelamoa parrotfish

Taxonomy. **New record** from Réunion, based on a specimen observed during a visual census, in the inner reef at Saint-Leu, in 2007 (E. TESSIER); authorship see FRICKE (2008: 50).

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Farquhar Islands, Amirantes, Seychelles. Marine species. Found in coral reefs including the reef flat, at depths of 0–25 m. Outside the area, Red Sea and East Africa east to Java/Indonesia.

Conservation. Vulnerable in Réunion (VU). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Leptoscarus vaigiensis* (Quoy & Gaimard, 1824) – Seagrass parrotfish, marbled parrotfish; Perroquet marbré

Taxonomy. First record from Réunion by FOURMANOIR & GUÉZÉ (1961a: 18).

Distribution. Réunion, Mauritius, Comores, Madagascar, Farquhar Islands, Amirantes, Seychelles. Marine species. Found in sheltered areas and lagoons, in seagrass areas or areas with hard substrates with thick algal cover adjacent to coral reefs, at depths of 1–15 m. Outside the area, Red Sea, East and South Africa east to Pitcairn, south to Western Australia, Lord Howe Island and Rapa.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Scarus caudofasciatus* (Günther, 1862) – Tail-barred parrotfish; Perroquet à bandes rouges

Taxonomy. First record from Réunion by BRUCE & RANDALL (1984: 2 unnumbered pp., pl. II); record confirmed by FRICKE (1999: 455–456), based on MHNRUN material.

Distribution. Réunion, Mauritius, Madagascar, Amirantes. Marine species. Found on steep outer coral reef slopes, at depths of 8–40 m. Outside the area, Red Sea and East Africa, south to Mozambique, east to Maldives.

Conservation. Endangered in Réunion (EN). Threats: FIT, PRL, HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Scarus falcipinnis* (Playfair, 1868) – Greenbelly parrotfish; Perroquet faucille

Taxonomy. First record from Réunion by BRUCE & RANDALL (1984: 2 unnumbered pp., pl. IV); record confirmed by LETOURNEUR et al. (2004: 214).

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Aldabra, Seychelles. Marine species. Found on steep outer coral reef slopes, at depths of 2–20 m. Outside the area, East Africa east to Chagos Archipelago.

Conservation. Endangered in Réunion (EN). Threats: FIT, PRL, HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Scarus frenatus* Lacepède [ex Commerson], 1802 – Bridled parrotfish, vermiculate parrotfish

Taxonomy. First record from Réunion by LETOURNEUR (1992: 40); record confirmed by FRICKE (1999: 457), based on USNM material.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Marine species. Found on exposed outer coral reefs, sometimes in very shallow water; juveniles occur among coral and rubble of lagoon reefs; at depths of 1–20 m. Outside the area, Red Sea and East Africa east to Line Islands and Ducie/Pitcairn Group, north to southern Japan and Ogasawara Islands, south to Shark Bay/Western Australia, Lord Howe Island and Rapa.

Conservation. Endangered in Réunion (EN). Threats: FIT, PRL, HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Scarus ghobban* Forsskål in Niebuhr, 1775 – Blue-barred parrotfish; Perroquet bleu (Réunion), perroquet à écailles jaunes (France)

Taxonomy. First record from Réunion as *Callyodon ghobban* by SMITH (1956: 10, pl. 43, fig. H); also described as *C. speigleri* by SMITH (1956: 14); record confirmed by FRICKE (1999: 457–458), based on MNHN and SMNS material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Amirantes, Seychelles. Transitional water and marine. Found in lagoon and seaward coral reefs, on slopes and drop-offs; small juveniles inshore on algae reef habitat; entering silty, murky environments; at depths of 1–36 m. Outside the area, Red Sea, East and South Africa east to Panama, north to southern Japan and Ogasawara Islands, south to Western Australia, New South Wales/Australia, Lord Howe Island and Rapa.

Conservation. Endangered in Réunion (EN). Threats: FIT, PRL, HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Scarus globiceps* Valenciennes in Cuvier & Valenciennes, 1840 – Violet-lined parrotfish, roundhead parrotfish, globehead parrotfish; Perroquet globeux

Taxonomy. First record from Réunion by BRUCE & RANDALL (1984: 2 unnumbered pp.).

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Marine species. Found in coral reefs, more common in outer coral reef habitats than in protected waters, at depths of 1–12 m. Outside the area, East and South Africa east to Wake, Line and Gambier islands, north to Ryukyu and Ogasawara islands, south to Shark Bay/Western Australia, Lord Howe Island and Rapa.

Conservation. Endangered in Réunion (EN). Threats: FIT, PRL, HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Scarus psittacus* Forsskål in Niebuhr, 1775 – Palenose parrotfish, common parrotfish; Perrouche (Réunion), perroquet commun (France)

Taxonomy. First record from Réunion by BRUCE & RANDALL (1984: 2 unnumbered pp.); previously listed as *S. venosus* by GUICHENOT (1863: C28); record confirmed by FRICKE (1999: 459–460), based on MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Seychelles. Marine species. Found on reef flats and in lagoon and seaward reefs, over corals, at depths of 0–25 m. Outside the area, Red Sea, East and South Africa east to Hawaiian and Marquesas islands, north to southern Japan, south to Shark Bay/Western Australia, Lord Howe Island and Rapa.

Conservation. Endangered in Réunion (EN). Threats: FIT, PRL, HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Scarus scaber* Valenciennes in Cuvier & Valenciennes, 1840 – Dusky-capped parrotfish; Perroquet marron (Réunion), perroquet à cinq celles (France)
Taxonomy. First record from Réunion by Guichenot (1863: C28); subsequently listed as *Callyodon oviceps* by Fourmanoir & Guézé (1961a: 19); record confirmed by Fricke (1999: 461–462), based on MHNRUN, MNHN and USNM material.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Marine species. Found in shallow lagoon coral reefs, in areas with dense coral cover, at depths of 1–20 m. Outside the area, Red Sea, East and South Africa east to Maldives and Chagos Archipelago.
Conservation. Endangered in Réunion (EN). Threats: FIT, PRL, HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

### Trichonotidae – Sand divers

*Trichonotus setiger* Bloch & Schneider, 1801 – Spotted sanddiver
Taxonomy. First record from Réunion by Fricke (1999: 462–463).
Distribution. Réunion, Mauritius, Madagascar. Marine species. Found in steep sand slopes in large aggregations; hovers above clean sandy bottoms, darts into the sand when disturbed; usually slightly silty habitat, at depths of 1–40 m. Outside the area, Persian/Arabian Gulf and East Africa east to Fiji, north to Ryukyu Islands, south to Queensland/Australia and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

### Uranoscopidae – Stargazers

*Uranoscopus archionema* Regan, 1921 – Stargazer
Taxonomy. First record from Réunion by Fricke (1999: 463), based on MNHN material; previously listed by Fourmanoir & Guézé (1962b: 5, fig. 4) as *Uranoscopus* sp. and *U. oligolepis* (non Bleeker, 1878).
Distribution. Réunion, Mauritius, Madagascar. Marine species. Found on sand bottoms near coral reefs, at depths of 30–150 m. Outside the area, East and South Africa.
Conservation. Data deficient in Réunion (DD). Threats: FIB, HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Uranoscopus sulphureus* Valenciennes in Cuvier & Valenciennes, 1832 – White-margined stargazer
Taxonomy. First record from Réunion by Letourneur et al. (2004: 205), based on MNHN material.
Distribution. Réunion. Marine species. Found on reef flats and sand bottoms near coral reefs, at 10–100 m. Outside the area, Red Sea and East Africa east to Tonga.
Conservation. Data deficient in Réunion (DD). Threats: FIB, HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

### Creediidae – Sand burrowers

*Chalixodytes tauensis* Schultz, 1943 – Sand dart
Taxonomy. **New record** from Réunion; previously listed by Fricke (1999: 463) as *C. chameleontoculis*, based on BPBM and SMNS material.
Distribution. Réunion, Mauritius, Aldabra, Seychelles. Marine species. Found in shallow sand and gravel bottoms, including tidal pools, at depths of 0–10 m. Outside the area, South and East Africa east to Marshall Islands and Pitcairn Group, south to New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Limnichthys nitidus* Smith, 1958 – Sand submarine
Taxonomy. First record from Réunion by Fricke (1999: 464), based on SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Marine species. Found in shallow sand and gravel bottoms, including tidal pools, at depths of 0–10 m. Outside the area, Red Sea, East and South Africa to Hawaiian Islands and Pitcairn Group, north to southern Japan, south to Middleton Reef, Loyalty Islands, and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

### Pinguipedidae – Sandsmelts, crocodilefishes

*Parapercis hexophtalma* (Cuvier [ex Ehrenberg] in Cuvier & Valenciennes, 1829) – Speckled sandperch, spotted sandsmelt; Pinge pintade
Taxonomy. First record from Réunion by Bleeker (1874: 78) as *P. hexophthalmus*.
Distribution. Réunion, Rodrigues, Comores, Madagascar, Aldabra, Amirantes, Seychelles. Marine species. Found on sand and rubble bottoms of shallow lagoon and protected seaward coral reefs, at depths of 0–22 m. Outside the area, Red Sea, East and South Africa east to Fiji and Tonga, possibly also Society Islands, north to Ryukyu Islands, south to Western Australia, and Lord Howe Island.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Parapercis maculata* (Bloch & Schneider, 1801) – Harlequin sandsmelt, harlequin sandperch; Pinge arlequin
Taxonomy. First record from Réunion by Fricke (1999: 22), based on MNHN material; previously listed by Fourmanoir & Guézé (1963: 464) as *P. pulchella*.
Distribution. Réunion, Comores. Marine species. Found in shallow estuaries and protected coastal bays near coral reefs, at depths of 1–25 m. Outside the area, East Africa east to Indonesia, north to southern Japan.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Parapercis punctata* (Cuvier in Cuvier & Valenciennes, 1829) – Réunion sandsmelt
Taxonomy. First record from Réunion by Guichenot (1863: C24); subsequently described as *P. guezei* by Fourmanoir (1966: 218–221, fig. 2); record confirmed by Fricke (1999: 465), based on MNHN material.
Distribution. Réunion, Aldabra. Marine species. Found on coral rubble bottom of coral reefs, at depths of 1–10 m. Endemic to islands in the southwestern Indian Ocean.
Conservation. Near threatened in Réunion (NT). Threats: HAB,

EUT. Local importance. Rare. Sensitive to human activities. Probable decline. High priority for conservation action.

*Parapercis punctulata* (Cuvier in Cuvier & Valenciennes, 1829) – Spotted sandperch, spotted sandsmelt
Taxonomy. First record from Réunion by Bleeker (1874: 78).
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles, Amirantes. Marine species. Found on rubble bottoms of coral reefs, at depths of 1–15 m. Outside the area, East Africa south to Natal/South Africa.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Parapercis robinsoni* Fowler, 1929 – Barfaced sandperch, smallscale grubfish
Taxonomy. First record from Réunion by Fricke (1999: 466), based on MNHN material; previously listed by Cuvier in Cuvier & Valenciennes (1829a: 260–264) as *P. nebulosa* (non Quoy & Gaimard, 1825).
Distribution. Réunion, Comores, Madagascar, Aldabra, Seychelles. Marine species. Found on rubble bottoms of coral reef slopes, at depths of 6–55 m. Outside the area, Red Sea, East and South Africa east to Pakistan.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

## Tripterygiidae – Triplefins

*Enneapterygius elegans* (Peters, 1877) – Hourglass triplefin
Taxonomy. First record from Réunion by Fricke (1994: 203–208); record confirmed by Fricke (1999: 467), based on MNHN, SMF and SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Agalega Islands, Seychelles, Cargados Carajos. Marine species. Found on coralline rock, including tidal pools, at depths of 0–15 m. Outside the area, East Africa to Sri Lanka, Taiwan to Ryukyu Islands, Cocos Keeling Islands, New Guinea and New Caledonia to Samoa and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Enneapterygius gruschkai* Holleman, 2005 – Gruschka's triplefin
Taxonomy. **New record** from Réunion, based on BPBM and SMNS material; previously listed as *Tripterygium* cf. *fasciatum* by Harmelin-Vivien (1976: 100), and as '*Enneapterygius* sp. (to be described by Holleman & Fricke)' by Fricke (1999: 466).
Distribution. Réunion, Mauritius, Comores, Seychelles, Cargados Carajos. Marine species. Found on rock bottoms, at depths of 0–8 m. Outside the area, Chagos Archipelago.
Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Enneapterygius philippinus* (Peters, 1869) – Minute triplefin
Taxonomy. First record from Réunion by Fricke (1997: 274–288); previously listed as *Tripterygion minutus* by Harmelin-Vivien (1976: 100); record confirmed by Fricke (1999: 467), based on SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Seychelles. Marine species. Found on coralline beach rock or reef flats, including tidal pools, at depths of 0–8 m (rarely below 2 m). Outside the area, east to Marshall Islands, Samoa, Tonga and Niue, north to Ryukyu Islands, south to northwestern Australia, Queensland/Australia and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Enneapterygius tutuilae* Jordan & Seale, 1906 – High hat triplefin
Taxonomy. First record from Réunion by Fricke (1999: 468).
Distribution. Réunion, Mauritius, Madagascar, Comores, Amirantes, Seychelles, Cargados Carajos. Marine species. Found on coralline rock, associated with coral reefs, including tidal pools, at depths of 0–32 m. Outside the area, Red Sea and East Africa east to Marshall, Line and Society islands, north to Ryukyu and Ogasawara islands, south to Western Australia, Moreton Bay/Queensland, Australia, New Caledonia, and Tonga.
Conservation. Endangered in Réunion (EN). Threats: HAB, EUT. Rare. Very sensitive to human activities. Significant decline. High priority for conservation action.

*Helcogramma fuscopinna* Holleman, 1982 – Blackfin triplefin
Taxonomy. First record from Réunion by Fricke (1999: 468–469), based on SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Agalega Islands, Seychelles, Cargados Carajos. Marine species. Found on coralline rock, associated with coral reefs, including tidal pools, at depths of 0–10 m. Outside the area, Gulf of Aden, East and South Africa east to Maldives and Chagos Archipelago.
Conservation. Endangered in Réunion (EN). Threats: HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action.

*Helcogramma obtusirostris* (Klunzinger, 1871) – Hotlips triplefin, Klunzinger's triplefin
Taxonomy. First record from Réunion by Fricke (1999: 468–469, as *H. obtusirostre*), based on SMNS material. The correct species name is '*obtusirostris*' as the gender of *Helcogramma* is feminine, based on the Greek γραμμή (line), not γραμμα (letter) (see Eschmeyer & Fricke 2008).
Distribution. Réunion, Mauritius, Comores, Madagascar, Aldabra, Seychelles, Cargados Carajos. Marine species. Found on coralline rock, associated with coral reefs, including tidal pools, at depths of 0–30 m. Outside the area, Ascension Island and Saint Helena, South and East Africa.
Conservation. Vulnerable in Réunion (VU). Threats: HAB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

## Clinidae – Klipfishes

*Springeratus polyporatus* Fraser, 1972 – Mascarene klipfish
Taxonomy. First record from Réunion by Fricke (1999: 469–470), based on USNM material.
Distribution. Réunion, Mauritius. Marine species. Found in rocky habitats among algae, including tidal pools, at depths of 0–10 m. Endemic to western Mascarenes.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

## Blenniidae – Blennies

*Alticus monochrus* (Bleeker, 1869) – Mascarene leaping blenny

Taxonomy. First record from Réunion by Bath (1986: 355); listed as *Alticus kirkii* (non Günther, 1868) by Fricke (1999: 470–471), based on BPBM, MNHN and SMNS material; previously listed as *Salarias alticus* (non Valenciennes in Cuvier & Valenciennes, 1836) by Guichenot (1863: C27), as *S. tridactylus* (non Bloch & Schneider [ex Forster], 1801) by Playfair & Günther (1867: X), as *Alticus saltatorius* (non Lacepède [ex Commerson], 1800) by Bleeker (1874: 74), and as *A. saliens* (non Forster, 1788) by Smith (1959b: 239). Taxonomic decision of Bath (1986: 355).

Distribution. Réunion, Mauritius, Rodrigues, Madagascar. Marine species. Found on rocks of the intertidal zone, at depths of 0–1 m, often climbing out of the water. Endemic to islands in the southwestern Indian Ocean.

Conservation. Data deficient in Réunion (DD). Threats: EUT, CON. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Antennablennius bifilum* (Günther, 1861) – Horned rockskipper

Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 99) as *Croaltus bifilum*; record confirmed by Fricke (1999: 471), based on SMNS material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra. Marine species. Found on coralline rock, including tidal pools, at depths of 0–15 m. Outside the area, Persian Gulf, East and South Africa east to India.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Aspidontus dussumieri* (Valenciennes in Cuvier & Valenciennes, 1836) – Floating blenny, lance blenny

Taxonomy. Original description from Réunion as *Blennechis dussumieri* by Valenciennes in Cuvier & Valenciennes (1836: 282–283); record confirmed by Fricke (1999: 471–472), based on MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Aldabra, Cargados Carajos. Marine species. Found in coral reefs and rocky areas, at depths of 1–20 m. Outside the area, Red Sea, East and South Africa east to Society and Tuamotu islands, north to southern Japan and Ogasawara Islands, south to Western Australia, northern New South Wales/Australia, New Caledonia and Tonga.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Aspidontus tractus* Fowler, 1903 – Mimic blenny

Taxonomy. First record from Réunion by Fricke (1999: 472), based on SMNS material; previously listed as *Petroscirtes filamentosus* (non Valenciennes in Cuvier & Valenciennes, 1836) by Harmelin-Vivien (1976: 99), and as *Aspidontus taeniatus* (non Quoy & Gaimard, 1834) by Letourneur (1998: 282). *Petroscirtes rostratus* Bleeker [ex Solander], 1857 is an unused senior synonym.

Distribution. Réunion, Mauritius, Comores, Madagascar, Aldabra, Agalega Islands. Marine species. Found in coral reefs and rocky areas, at depths of 1–20 m; mimics *Labroides dimidiatus*. Outside the area, Red Sea, East and South Africa.

Conservation. Data deficient in Réunion (DD). Threats: PRL, HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Blenniella chrysospilos* (Bleeker, 1857) – Red-spotted blenny

Taxonomy. First record from Réunion by Fricke (1999: 472), based on SMNS material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Aldabra, Amirantes, Seychelles. Marine species. Found on reef flats, often in exposed habitats, usually where algal growth is prolific, at depths of 0–6 m, rarely below 2 m. Outside the area, East Africa east to Society Islands, north to Ryukyu Islands, south to Queensland/Australia, New Caledonia, and Tonga.

Conservation. Data deficient in Réunion (DD). Threats: HAB. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Blenniella cyanostigma* (Bleeker, 1849) – Striped rockskipper

Taxonomy. First record from Réunion by Fricke (1999: 472–473), based on SMNS material.

Distribution. Réunion, Comores, Madagascar, Aldabra. Marine species. Found on coastal reef flats, often in exposed habitats, usually where algal growth is prolific, at depths of 0–6 m, rarely below 2 m. Outside the area, East Africa east to western Indonesia.

Conservation. Data deficient in Réunion (DD). Threats: HAB. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Blenniella gibbifrons* (Quoy & Gaimard, 1824) – Picture rockskipper

Taxonomy. First record from Réunion by Fricke (1999: 473), based on SMNS material; previously listed as *Istiblennius gibbifrons insolitus* by Harmelin-Vivien (1976: 99).

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Agalega Islands, Seychelles. Marine species. Found on coastal reef flats, often in exposed habitats, usually where algal growth is prolific, at depths of 0–1.5 m. Outside the area, East Africa east to Hawaiian, Marquesas and Ducie islands, with a gap in the Indo-Australian triangle.

Conservation. Data deficient in Réunion (DD). Threats: HAB. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Blenniella periophthalmus* (Valenciennes in Cuvier & Valenciennes, 1836) – Blue-dashed rockskipper, bullethead rockskipper

Taxonomy. First record from Réunion by Guichenot (1863: C27); subsequently listed as *Salarias meleagris* (non Valenciennes in Cuvier & Valenciennes, 1836) by Playfair & Günther (1867: X); record of *Blenniella periophthalmus* confirmed by Fricke (1999: 473–474), based on MNHN and SMNS material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Agalega Islands, Seychelles. Marine species. Found on coastal reef flats, often in exposed habitats, usually where algal growth is prolific, at depths of 0–1.5 m. Outside the area, East Africa east to Hawaiian, Marquesas and Gambier islands.

Conservation. Data deficient in Réunion (DD). Threats: HAB. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Cirripectes castaneus* (Valenciennes in Cuvier & Valenciennes, 1836) – Muzzled rockskipper, chestnut blenny

Taxonomy. First record from Réunion by Williams (1988: 27–31); previously listed as *C. variolosus* (non Valenciennes in Cuvier & Valenciennes, 1836) by Smith (1959b: 238); record

confirmed by FRICKE (1999: 474–475), based on BPBM and SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Agalega Islands, Seychelles, Cargados Carajos. Marine species. Found on wave-swept algal ridges of outer reef flats, or on rocky and coralline substrates, at depths of 0–10 m. Outside the area, Red Sea, East and South Africa east to Kapingamarangi/Micronesia and Samoa, north to southern Japan and Ogasawara Islands, south to Western Australia and New South Wales/Australia, Lord Howe and Kermadec islands, and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Cirripectes polyzona* (Bleeker, 1868) – Barred blenny
Taxonomy. First record from Réunion by LETOURNEUR (1992: unpag. 6); record confirmed by FRICKE (1999: 475), based on SMNS material.
Distribution. Réunion, Mauritius, Comores, Aldabra, Seychelles. Marine species. Found on algal ridge and ridge crests between surge channels of exposed seaward reefs, at depths of 0–10 m. Outside the area, East and South Africa east to Johnston, Line and Samoan islands, north to southern Japan and Ogasawara Islands, south to Western Australia, New Caledonia, and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Cirripectes quagga* (Fowler & Ball, 1924) – Squiggly blenny
Taxonomy. First record from Réunion by WILLIAMS (1988: 57–60); record confirmed by FRICKE (1999: 475), based on BPBM and SMNS material.
Distribution. Réunion, Mauritius, Aldabra, Agalega Islands, Cargados Carajos. Marine species. Found on algal ridge and crests between surge channels of exposed seaward coral reefs, at depths of 0–19 m, usually shallow. Outside the area, East and South Africa east to southern Great Barrier Reef/Australia.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Cirripectes randalli* Williams, 1988 – Randall's blenny
Taxonomy. First record from Réunion by FRICKE (1999: 475–476), based on SMNS material.
Distribution. Réunion, Mauritius, Cargados Carajos. Marine species. Found on volcanic rocks with some algal cover, at depths of 0–5 m. Endemic to islands in the southwestern Indian Ocean.
Conservation. Near threatened in Réunion (NT). Threats: EUT. Local importance. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Cirripectes stigmaticus* Strasburg & Schultz, 1953 – Reticulated blenny, red-streaked blenny
Taxonomy. First record from Réunion by FRICKE (1999: 476), based on SMNS material.
Distribution. Réunion, Mauritius, Comores, Madagascar, Cargados Carajos. Marine species. Found on coastal reef flats with rich coral and algae habitats, also on rocky and coralline structures, among *Acropora* and *Pocillopora* corals of surf-swept algal ridge, at depths of 0–10 m. Outside the area, East Africa east to Marshall Islands, Samoa and Tonga, north to Ryukyu Islands, south to Western Australia, and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: HOS, HAB, EUT. Very sensitive to human activities. Probable decline. Medium priority for conservation action.

*Damania anjouanae* (Fourmanoir, 1955) – Anjouan blenny
Taxonomy. First record from Réunion by FRICKE (1999: 476), based on SMF material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Seychelles. Marine species. Found on volcanic rocks including tidal pools, at depths of 0–4 m. Endemic to islands in the southwestern Indian Ocean.
Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Dodekablennos fraseri* Springer & Spreitzer, 1978 – Fraser's blenny
Taxonomy. First record from Réunion by FRICKE (1999: 477), based on MNHN material.
Distribution. Réunion, Mauritius. Marine species. Found in tidal pools, at depths of 0–2 m. Endemic to western Mascarenes.
Conservation. Data deficient in Réunion (DD). Threats: EUT, CON. Local importance. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Ecsenius lineatus* Klausewitz, 1962 – Linear blenny
Taxonomy. First record from Réunion by MCKINNEY & SPRINGER (1976: 7); record questionably confirmed by FRICKE (1999: 477–478), based on BPBM material.
Distribution. Réunion, Mauritius. Marine species. Found in clear coastal to outer reef crests with rich coral growth, at depths of 2–28 m. Outside the area, Maldives east to Philippines, north to southern Japan, south to northwestern Australia.
Conservation. Endangered in Réunion (EN). Threats: HOS, HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action.

*Ecsenius midas* Starck, 1969 – Persian blenny
Taxonomy. First record from Réunion by LETOURNEUR et al. (2004: 205).
Distribution. Réunion, Mauritius, Seychelles. Marine species. Found in coral reefs, from clear coastal to outer reef walls, usually where currents are moderate, at depths of 1–40 m. Outside the area, Red Sea and East Africa east to Marquesas Islands.
Conservation. Endangered in Réunion (EN). Threats: HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action.

*Enchelyurus kraussii* (Klunzinger, 1871) – Krauss' blenny
Taxonomy. First record from Réunion by FRICKE (1999: 478), based on SMNS material.
Distribution. Réunion, Mauritius, Comores, Seychelles. Marine species. Found among coral and rubble on reef flats and upper portion of seaward reefs, including tidal pools, at depths of 0–10 m. Outside the area, Red Sea east to Mariana Islands and Tonga, north to Ryukyu and Ogasawara islands, south to southern Great Barrier Reef/Australia and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Very sensitive to human activities. Probable decline. Medium priority for conservation action.

*Entomacrodus epalzeocheilos* (Bleeker, 1859) – Fringelip rockskipper
Taxonomy. First record from Réunion by FRICKE (1999: 479), based on BPBM and SMNS material.

Distribution. Réunion, Mauritius, Comores, Madagascar. Marine species. Found in exposed intertidal areas and the upper subtidal, on rocks with algae, at depths of 0–3 m. Outside the area, South and East Africa east to Easter Island, north to Ryukyu and Ogasawara islands, south to Tonga.
Conservation. Data deficient in Réunion (DD). Threats: HAB, CON. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Entomacrodus lemuria* Springer & Fricke, 2000 – Lemur blenny
Taxonomy. Originally described from Réunion by Springer & Fricke (2000: 391, figs. 3–4), based on SMNS material; previously listed as *Entomacrodus* sp. by Fricke (1999: 478).
Distribution. Réunion, Mauritius. Marine species. Found in an intertidal area with volcanic rocks partially covered with algae, at depths of 0–1 m. Endemic to western Mascarenes.
Conservation. Near threatened in Réunion (NT). Threats: HAB, CON. Local importance. Rare. Sensitive to human activities. Probable decline. High priority for conservation action. Proposed for Annex II of the EU Habitats Directive.

*Entomacrodus striatus* (Valenciennes [ex Quoy & Gaimard] in Cuvier & Valenciennes, 1836) – Pearly rockskipper
Taxonomy. First record from Réunion by Smith (1959b: 241); previously listed as *Salarias frenatus* by Guichenot (1863: C27); record of *Entomacrodus striatus* confirmed by Fricke (1999: 479–480), based on MNHN and SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Aldabra, Seychelles, Cargados Carajos. Marine species. Found in the intertidal zone of lagoons and wave-swept seaward reefs, at depths of 0–1 m. Outside the area, Red Sea east to Wake Atoll and Pitcairn Group, north to Ryukyu and Ogasawara islands and Minami Tori Shima, south to Western Australia, Lord Howe Island and Rapa.
Conservation. Data deficient in Réunion (DD). Threats: HAB, CON. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Exallias brevis* (Kner, 1868) – Shortbodied blenny, leopard blenny, leopard rockskipper
Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 99); record confirmed by Fricke (1999: 480–481), based on LEMUR and SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Seychelles, Cargados Carajos. Marine species. Found in clear coastal reefs, often in bays and semi-exposed habitats, among corals like *Acropora*, *Pocillopora*, *Seriatopora*, *Porites*, and *Millepora* where they feed on coral tissues; at depths of 0–20 m. Outside the area, East Africa east to Henderson Island/Pitcairn Group, south to Western Australia, New Caledonia and Rapa.
Conservation. Endangered in Réunion (EN). Threats: HOS, HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action.

*Istiblennius bellus* (Günther, 1861) – Imspringer
Taxonomy. First record from Réunion by Springer & Williams (1994: 143–149); record confirmed by Fricke (1999: 481), based on MNHN and SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar. Marine species. Found in exposed rockpools or on exposed rocky shores, at depths of 0–2 m. Outside the area, South and East Africa east to Marquesas and Easter islands, north to Ryukyu Islands, south to Tonga.
Conservation. Data deficient in Réunion (DD). Threats: HAB, CON. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Istiblennius dussumieri* (Valenciennes in Cuvier & Valenciennes, 1836) – Dussumier's rockskipper
Taxonomy. First record from Réunion by Guichenot (1863: C27) as *Blennioides Dussumieri*.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles. Marine species. Found along sheltered and semi-exposed rocky shorelines, at depths of 0–3 m. Outside the area, South and East Africa east to Society Islands, north to Taiwan, south to New South Wales/Australia and Norfolk Island.
Conservation. Data deficient in Réunion (DD). Threats: HAB, CON. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Istiblennius edentulus* (Schneider [ex Forster] in Bloch & Schneider, 1801) – Rippled rockskipper
Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 99); previously listed as *Salarias quadricornis* by Guichenot (1863: C27); record confirmed by Fricke (1999: 482–483), based on MHNRUN, MNHN, SMNS and USNM material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Farquhar Islands, Seychelles, Cargados Carajos. Marine species. Found in rubble or rock areas, including tidal pools, at depths of 0–5 m. Outside the area, Red Sea, East and South Africa east to Wake Atoll and Pitcairn, north to southern Japan and Ogasawara Islands, south to Western Australia, New South Wales/Australia, Lord Howe Island and Rapa.
Conservation. Data deficient in Réunion (DD). Threats: HAB, CON. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Istiblennius spilotus* Springer & Williams, 1994 – Rockskipper
Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 99); record confirmed by Fricke (1999: 483), based on SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Marine species. Found on exposed and semi-exposed rocky shores, including tidal pools, at depths of 0–5 m. Outside the area, Arabian Sea south to South Africa.
Conservation. Data deficient in Réunion (DD). Threats: HAB, CON. Sensitive to human activities. Probable decline. Medium priority for conservation action.

**Mimoblennius lineathorax* Fricke, 1999 – Lined-throat blenny
Taxonomy. Originally described from Réunion by Fricke (1999: 484–486, fig. 8), based on MNHN, SMNS and USNM material.
Distribution. Réunion. Marine species. Found on exposed volcanic rocks covered with algae, at depths of 0–1.5 m. Endemic to Réunion.
Conservation. Near threatened in Réunion (NT). Threats: HAB, CON. Global importance. Sensitive to human activities. Decline unknown. Medium priority for conservation action.

*Omobranchus fasciolatus* (Valenciennes [ex Ehrenberg] in Cuvier & Valenciennes, 1836) – Arab blenny
Taxonomy. First record from Réunion by Fricke (1999: 487), based on SMNS material.
Distribution. Réunion, Madagascar. Marine species. Found in shallow rocky areas, including tidal pools, at depths of

0–3 m. Outside the area, Red Sea and East Africa east to Pakistan.
Conservation. Data deficient in Réunion (DD). Threats: HAB, CON. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Petroscirtes mitratus* Rüppell, 1830 – Highfin fangblenny, floral fangblenny
Taxonomy. First record from Réunion by Letourneur (1992, unpag. 6).
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Amirantes, Seychelles, Cargados Carajos. Marine species. Found in protected lagoons and reef flats with algal and seagrass clumps, juveniles often in floating *Sargassum*; at depths of 0–8 m. Outside the area, Red Sea and East Africa east to Samoa and Tonga, north to Ryukyu Islands, south to Perth/Western Australia, Queensland/Australia, and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Plagiotremus rhinorhynchos* (Bleeker, 1852) – Twostripe blenny
Taxonomy. First record from Réunion by Letourneur (1998: 283).
Distribution. Réunion, Mauritius, Madagascar, Aldabra, Seychelles. Marine species. Found in clear, coral-rich areas of lagoon and seaward reefs, hiding in deserted worm tubes or other small holes when alarmed; at depths of 0–40 m. Outside the area, South and East Africa east to Marshall, Society and Marquesas islands, north to southern Japan and Ogasawara Islands, south to Western Australia, Lord Howe Island and Tonga.
Conservation. Endangered in Réunion (EN). Threats: PRL, HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action.

*Plagiotremus tapeinosoma* (Bleeker, 1857) – Piano blenny
Taxonomy. First record from Réunion by Letourneur (1992: 53).
Distribution. Réunion, Mauritius, Madagascar, Aldabra, Seychelles, Cargados Carajos. Marine species. Found in clear lagoon and seaward reefs; hiding in deserted worm tubes when alarmed; at depths of 0–30 m. Outside the area, South and East Africa east to Wake Atoll and Pitcairn Group, north to central Japan and Ogasawara Islands, south to Western Australia, New South Wales/Australia, northern New Zealand and Rapa.
Conservation. Endangered in Réunion (EN). Threats: HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action.

*Salarias fasciatus* (Bloch, 1786) – Jewelled rockskipper
Taxonomy. First record from Réunion by Bleeker (1874: 74); record confirmed by Fricke (1999: 489), based on SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Aldabra, Amirantes, Seychelles. Marine species. Found in areas of mixed coral, sand, and rubble, or on coralline rock, at depths of 0–8 m. Outside the area, Red Sea and East Africa east to Marshall Islands and Samoa, north to Ryukyu Islands, south to Western Australia, New Caledonia, and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Stanulus seychellensis* Smith, 1959 – Seychelles blenny
Taxonomy. First record from Réunion by Fricke (1999: 489), based on SMNS material.
Distribution. Réunion, Mauritius, Agalega Islands, Seychelles. Marine species. Found in surge areas of exposed outer reef flats and seaward reefs, at depths of 0–5 m. Outside the area, Caroline Islands and eastern Australia east to Marshall Islands and Henderson/Pitcairn Group, north to southern Taiwan, south to Tonga.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Xiphasia setifer* Swainson, 1839 – Snake blenny
Taxonomy. **New record** from Réunion, based on a specimen observed and photographed during a visual census, at Saint-Paul, at 40 m depth, in 2005 (P. Durville).
Distribution. Réunion, Mauritius, Madagascar. Marine species. Found on open soft-bottom and mud habitats, at depths of 2–100 m. Outside the area, Red Sea, East and South Africa east to Vanuatu, north to southern Japan.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

## Gobiesocidae – Clingfishes

*Lepadichthys minor* Briggs, 1955 – Dwarf clingfish, minor clingfish
Taxonomy. First record from Réunion and the Mascarenes by Fricke (1999: 111), based on SMNS material.
Distribution. Réunion. Marine species. Found on coral reef flats, attached to coralline rock in lagoons, and in tidal pools, at depths of 0–4 m. Outside the area, Indonesia to Cook Islands, south to New Caledonia and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

## Callionymidae – Dragonets

*Callionymus aagilis* Fricke, 1999 – Slow dragonet
Taxonomy. Originally described from Réunion by Fricke (1999: 491–493, fig. 9), based on the holotype (MNHN 1966-0833).
Distribution. Réunion, Mauritius [new record by Fricke (2009: 170), based on BMNH 2002.6.30.1302]. Marine species. Sand bottom, probably adjacent to rocks and corals, at depths around 30 m, possibly also deeper. Endemic to western Mascarenes.
Conservation. Near threatened in Réunion (NT). Threats: FIB, HAB, EUT. Local importance. Rare. Sensitive to human activities. Probable decline. High priority for conservation action.

*Synchiropus stellatus* Smith, 1963 – Starry dragonet
Taxonomy. First record from Réunion and the Mascarenes by Fricke (1999: 494).
Distribution. Réunion, Mauritius, Seychelles, Cargados Carajos. Marine species. Found in protected reefs on rubble or algal covered rocks, at depths of 5–40 m. Outside the area, East and South Africa east to western Indonesia.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

### Eleotridae – Sleepers

*Butis butis* (Hamilton, 1822) – Duckbill sleeper

Taxonomy. First record from Réunion by Sauvage (1891: 380–381, pl. 41A, fig. 2); record confirmed by Fricke (1999: 494), based on MNHN material.

Distribution. Réunion, Mauritius, Seychelles, Cargados Carajos. Freshwater, transitional water and marine. Found in brackish estuaries and lower reaches of freshwater streams, usually on mud bottoms; also in lagoons, particularly where there is vegetation. Outside the area, East and South Africa east to New Guinea, north to South China Sea, south to northern Australia.

Conservation. Vulnerable in Réunion (VU). Threats: EUT, CON. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Eleotris fusca* (Schneider [ex Forster] in Bloch & Schneider, 1801) – Dusky sleeper; Cabot noir (Réunion)

Taxonomy. First record from Réunion by Blanc & Postel (1958: 370); previously listed as *E. niger* by Guichenot (1863: C27); record confirmed by Fricke (1999: 494), based on MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Freshwater, transitional water and marine. Found in lagoons, estuaries and freshwater; occurs in the lower reaches of freshwater streams, usually on mud bottoms. Outside the area, Transkei/South Africa and East Africa east to Gambier and Marquesas islands, north to Ryukyu Islands, south to New Caledonia and Rapa.

Conservation. Data deficient in Réunion (DD). Threats: EUT, CON. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Eleotris mauritiana* Bennett, 1832 – Widehead sleeper; Cabot noir (Réunion)

Taxonomy. First record from Réunion by Marquet et al. (1997: 30); record confirmed by Fricke (1999: 495–496), based on MHNRUN, MNHN and SAIAB material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Freshwater, transitional water and marine. Found in lagoons, estuaries and freshwater; occurs in the lower reaches of freshwater streams, usually on mud bottoms. Outside the area, South and East Africa.

Conservation. Vulnerable in Réunion (VU). Threats: EUT, CON. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action. Proposed for Annex II of the EU Habitats Directive.

*Hypseleotris cyprinoides* (Valenciennes in Cuvier & Valenciennes, 1837) – Tropical carp-gudgeon; Éléotris cyprin (France)

Taxonomy. Originally described from Réunion by Valenciennes in Cuvier & Valenciennes (1837: 248–249) as *Eleotris cyprinoides*; record confirmed by Fricke (1999: 496), based on MNHN material.

Distribution. Réunion, Mauritius, Madagascar. Freshwater and transitional water. Found in lower reaches of freshwater streams. Outside the area, east to New Guinea, north to Philippines, south to Queensland/Australia.

Conservation. Extinct in Réunion (RE); not found since 1822 (see Keith et al. 1999: 108). Threats: EUT, CON. Very sensitive to human activities. High priority for conservation action.

*Ophiocara porocephala* (Valenciennes in Cuvier & Valenciennes, 1837) – Flathead sleeper; Cabot marare (Réunion), éléotris à tête poreuse (France)

Taxonomy. First record from Réunion by Guichenot (1863: C27) as *Eleotris porocephala*.

Distribution. Réunion, Mauritius, Madagascar, Seychelles. Freshwater, transitional water and marine. Found in brackish estuaries, river mouths and freshwater creeks, also in the lower courses of rivers, often upstream from the tidal zone. Outside the area, South and East Africa east to Fiji, north to southern Japan, south to Western Australia, Queensland/Australia and New Caledonia.

Conservation. Vulnerable in Réunion (VU). Threats: EUT, CON. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

### Gobiidae – Gobies

*Amblyeleotris aurora* (Polunin & Lubbock, 1977) – Pinkbar goby

Taxonomy. **New record** from Réunion, based on specimens observed and photographed during a visual census, in the outer and inner coral reef, in 2006 (A. Diringer, T. Mulochau, P. Durville, T. Cadet).

Distribution. Réunion. Marine species. Found on sand and rubble bottoms adjacent to coral reefs, in symbiosis with the alpheid shrimp *Alpheus randalli*, at depths of 1–35 m. Outside the area, South Africa east to Andaman Sea.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Amblyeleotris latifasciata* Polunin & Lubbock, 1979 – Broadband prawn-goby

Taxonomy. **New record** from Réunion, based on specimens observed and photographed during a visual census, at Saint-Paul, at 40 m depth, in Aug. 2008 (A. Diringer, T. Mulochau, P. Durville, T. Cadet).

Distribution. Réunion. Marine species. Found on sand and rubble bottoms adjacent to coral reefs, in symbiosis with alpheid shrimps, at depths of 10–40 m. Outside the area, east to Philippines.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Amblyeleotris periophthalma* (Bleeker, 1853) – Periophthalma prawn-goby

Taxonomy. **New record** from Réunion, based on specimens observed and photographed during a visual census, in the outer and inner coral reef, in 2006 (A. Diringer, T. Mulochau, P. Durville, T. Cadet).

Distribution. Réunion, Mauritius (new record, based on USNM 347790–347791). Marine species. Found on sand and rubble bottoms adjacent to coral reefs, in symbiosis with alpheid shrimps, at depths of 5–35 m. Outside the area, Red Sea and East Africa east to Samoa.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Amblyeleotris steinitzi* (Klausewitz, 1974) – Steinitz's prawn-goby

Taxonomy. **New record** from Réunion, based on specimens observed and photographed during a visual census, on the

outer and inner coral reef, in Aug. 2008 (A. DIRINGER, T. MULOCHAU, P. DURVILLE, T. CADET).

Distribution. Réunion, Seychelles. Marine species. Found on sand and rubble bottoms adjacent to coral reefs, in symbiosis with alpheid shrimps, at depths of 1–43 m. Outside the area, Red Sea and East Africa east to Marshall and Samoan islands, north to Yaeyama Islands, south to Chesterfield Islands.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Amblyeleotris wheeleri* (Polunin & Lubbock, 1977) – Gorgeous goby

Taxonomy. First record from Réunion by FRICKE (1999: 497), based on underwater photographs.

Distribution. Réunion, Mauritius, Rodrigues, Cargados Carajos. Marine species. Found in rubble areas near or within coral reefs and in symbiotic association with alpheid shrimps, at depths of 3–40 m. Outside the area, East and South Africa east to Marshall Islands, north to southern Japan and Ogasawara Islands, south to northwestern Australia and Great Barrier Reef/Australia.

Conservation. Data deficient in Réunion (DD). Threats: HOS, HAB, EUT. Rare. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Amblygobius semicinctus* (Bennett, 1833) – Halfstreak goby

Taxonomy. **New record** from Réunion, based on specimens observed and photographed during a visual census, on the outer and inner coral reef, in 2006 (A. DIRINGER, T. MULOCHAU, P. DURVILLE, T. CADET).

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles, Cargados Carajos. Transitional water and marine. Found in protected, silty lagoons and estuaries, at depths of 0–10 m. Outside the area, East Africa east to eastern Indonesia.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Low priority for conservation action.

*Amoya signata* (Peters, 1855) – Tusk goby

Taxonomy. First record from Réunion by FRICKE (1999: 498); previously listed as *Ctenogobius pavidus* by HARMELIN-VIVIEN (1976: 100).

Distribution. Réunion. Marine species. Found on the reef crest and in the lagoon adjacent to coral reefs, at depths of 0–3 m. Outside the area, East Africa.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Asterropteryx semipunctata* Rüppell, 1830 – Starry goby, starryfin goby, blue-spotted goby

Taxonomy. First record from Réunion by HARMELIN-VIVIEN (1976: 100); record confirmed as *Asterropterix semipunctatus* by FRICKE (1999: 498–499), based on SMNS and USNM material.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Aldabra, Seychelles, Cargados Carajos. Marine species. Found on algal-coated reef rock and rubble of inner flats and turbid coral reef lagoons, at depths of 0–12 m. Outside the area, Red Sea, East and South Africa east to Wake Atoll, Hawaiian and Tuamotu islands, north to southern Japan and Ogasawara Islands, south to Western Australia, Lord Howe Island and Rapa.

Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitive to human activities. Decline unknown. Medium priority for conservation action.

*Awaous commersoni* (Schneider in Bloch & Schneider, 1801) – River goby, Commerson's freshwater goby; Loche, cabot (Réunion)

Taxonomy. First record from Réunion as *Gobius commersonii* by SMITH (1959a: 215); previously described as *G. nigripinnis* by VALENCIENNES in CUVIER & VALENCIENNES (1837: 101), and listed as *G. ocellaris* (non Broussonet, 1782) by GUICHENOT (1863: C27); record confirmed by FRICKE (1999: 499–500), based on MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar. Freshwater and transitional water. Found in slow to fast current waters from the estuary to 250 m altitude, usually occurring in clear waters with sand, gravel or rock bottom. Endemic to islands in the southwestern Indian Ocean.

Conservation. Vulnerable in Réunion (VU). Threats: EUT, CON. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action. Proposed for Annexes II and IV of the EU Habitats Directive.

*Bathygobius coalitus* (Bennett, 1832) – White-spotted goby

Taxonomy. First record from Réunion by FRICKE (1999: 500–501), based on SMNS material; previously listed as *Gobius albopunctatus* by BLEEKER (1874: 500).

Distribution. Réunion, Rodrigues, Madagascar, Aldabra, Seychelles. Marine species. Found in lagoon, rockpool and intertidal areas with coralline rock adjacent to sand or mud areas, at depths of 0–3 m. Outside the area, East and South Africa east to Hawaiian and Marquesas islands, north to southern Japan, south to Queensland/Australia and New Caledonia.

Conservation. Data deficient in Réunion (DD). Threats: HAB, CON. Sensitive to human activities. Keystone species. Decline unknown. Medium priority for conservation action.

*Bathygobius cocosensis* (Bleeker, 1854) – Cocos frillgoby

Taxonomy. First record from Réunion by FRICKE (1999: 501), based on SMNS material.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Aldabra, Agalega Islands, Seychelles. Marine species. Found among rubble, in sand pockets, or on coralline rock, abundant on silty intertidal reef flats, at depths of 0–5 m. Outside the area, East and South Africa east to Pitcairn, north to southern Japan, south to Western Australia, Queensland/Australia, New Caledonia and Rapa.

Conservation. Data deficient in Réunion (DD). Threats: HAB. Sensitive to human activities. Keystone species. Decline unknown. Medium priority for conservation action.

*Bathygobius cotticeps* (Steindachner, 1880) – Cheek-scaled frillgoby

Taxonomy. First record from Réunion by FRICKE (1999: 501), based on SMNS material.

Distribution. Réunion, Rodrigues. Marine species. Found in reef and lagoon areas with rocks and gravel, including tidal pools, at depths of 0–6 m. Outside the area, East and South Africa east to Hawaiian Islands and Pitcairn Group, north to southern Japan and Ogasawara Islands, south to Queensland/Australia, New Caledonia and Tonga.

Conservation. Data deficient in Réunion (DD). Threats: HAB. Rare. Sensitive to human activities. Decline unknown. Medium priority for conservation action.

*Bathygobius cyclopterus* (Valenciennes in Cuvier & Valenciennes, 1837) – Spotted frillgoby
Taxonomy. First record from Réunion by Fricke (1999: 502), based on SMNS material.
Distribution. Réunion, Comores, Madagascar, Seychelles. Marine species. Found on intertidal seaward reef flats and adjacent reefs including tidal pools, in habitats with coralline rock adjacent to gravel or sand, at depths of 0–10 m. Outside the area, Red Sea, East and South Africa east to Mariana and Samoan islands, north to southern Japan, south to Western Australia and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: HAB, CON. Rare. Sensitive to human activities. Decline unknown. Medium priority for conservation action.

*Bathygobius fuscus* (Rüppell, 1830) – Dusky frillgoby
Taxonomy. First record from Réunion by Marquet et al. (1997: 30); record confirmed by Fricke (1999: 502), based on SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles. Freshwater, transitional water and marine. Found in shallow rocky areas, often in tidal pools; also in estuaries, and ascending into freshwater streams; at depths of 0–6 m. Outside the area, Red Sea and East Africa east to Wake, Gambier and Marquesas islands, north to South Korea and southern Japan, south to Western Australia, Queensland/Australia, Norfolk Island and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT, CON. Sensitive to human activities. Keystone species. Decline unknown. Medium priority for conservation action.

*Bathygobius smithi* Fricke, 1999 – Black minigoby
Taxonomy. Alternative name *Bathygobius niger* (Smith, 1960), if the West African species *Gobius nigri* Günther, 1861 is not in *Bathygobius*. First record from Réunion by Fricke (1999: 502), based on SMNS material.
Distribution. Réunion. Marine species. Found in shallow rocky areas, often in pools of the intertidal zone, with rocks, gravel and sand, at depths of 0–4 m. Outside the area, South Africa, India to Sri Lanka.
Conservation. Data deficient in Réunion (DD). Threats: HAB, CON. Sensitive to human activities. Decline unknown. Low priority for conservation action.

*Cabillus tongarevae* (Fowler, 1927) – Tongareva goby
Taxonomy. First record from Réunion by Fricke (1999: 504), based on SMNS material.
Distribution. Réunion, Mauritius(?), Aldabra. Marine species. Found on sandy bottoms of lagoon and seaward coral reefs, at depths of 0.5–9 m. Outside the area, east to Hawaiian, Line and Phoenix islands, north to southern Japan, south to Western Australia, Chesterfield Islands, and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Callogobius flavobrunneus* (Smith, 1958) – Slimy goby
Taxonomy. First record from Réunion by Fricke (1999: 504), based on SMNS material; previously listed as *Mucogobius* sp. by Harmelin-Vivien (1976: 100).
Distribution. Réunion, Mauritius, Rodrigues, Aldabra, Amirantes, Seychelles, Cargados Carajos. Marine species. Found associated with lagoon and seaward reefs, usually under coralline rocks or in caves, at depths of 0.5–5 m. Outside the area, Red Sea and East Africa east to Chagos Archipelago.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Very sensitive to human activities. Probable decline. Medium priority for conservation action.

*Callogobius sclateri* (Steindachner, 1879) – Pacific goby
Taxonomy. First record from Réunion by Fricke (1999: 504–505), based on SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Amirantes, Cargados Carajos. Marine species. Found in crevices and caves of the coral reef, usually under loose debris, at depths of 0.5–35 m. Outside the area, Red Sea, East and South Africa east to Gambier and Marquesas islands, north to southern Japan and Ogasawara Islands, south to Western Australia, Queensland/Australia, New Caledonia and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Very sensitive to human activities. Probable decline. Medium priority for conservation action.

*Cotylopus acutipinnis* Guichenot, 1863 – Mascarene goby; Cabot à bouche ronde, cabot de cascade, bichique, gobie (Réunion)
Taxonomy. Originally described from Réunion by Guichenot (1863: C10–C11, C27); also described as *C. parvipinnis* by Guichenot (1863: C11–C13, C27); Watson (1995: 65–68) acted as the first reviewer chosing *Cotylopus acutipinnis* as the senior synonym; record confirmed by Fricke (1999: 506–507), based on MHNRUN and MNHN material.
Distribution. Réunion, Mauritius. Freshwater, transitional water and marine. Found in swift clear rainforest streams; hatching and larval stages in the sea, post-larvae and adults in freshwater. Endemic to western Mascarenes.
Conservation. Endangered in Réunion (EN). Threats: HAB, EUT, CON. Rare. Local importance. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action. Proposed for Annex II of the EU Habitats Directive.

*Cryptocentrus fasciatus* (Playfair in Playfair & Günther, 1867) – Barred prawn goby, Y-bar shrimp goby
Taxonomy. First record from Réunion by Fricke (1999: 507).
Distribution. Réunion, Rodrigues, Madagascar. Marine species. Found on sand near patch reefs, in burrows with alpheid shrimps, at depths of 1–20 m. Outside the area, Red Sea and East Africa east to Indonesia and New Guinea, south to Queensland/Australia and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: HOS, HAB, EUT. Rare. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Eviota distigma* Jordan & Seale, 1906 – Twospot pygmy goby
Taxonomy. First record from Réunion by Fricke (1999: 508), based on SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Aldabra, Seychelles. Marine species. Found on and among live corals in lagoon and seaward reefs, at depths of 0–6 m. Outside the area, Red Sea and East Africa east to Tuamotu Archipelago, north to Ryukyu Islands, south to Western Australia, New Caledonia and Austral Islands.
Conservation. Endangered in Réunion (EN). Threats: HOS, HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action.

*Eviota indica* Lachner & Karnella, 1980 – Indian Ocean pygmy goby
Taxonomy. First record from Réunion by Fricke (1999: 508), based on SMNS material.

Distribution. Réunion, Mauritius, Rodrigues, Seychelles, Cargados Carajos. Marine species. Found on and among live corals in lagoon and seaward reefs, at depths of 0–5 m. Endemic to islands in the western Indian Ocean.
Conservation. Endangered in Réunion (EN). Threats: HOS, HAB, EUT. Rare. Very sensitive to human activities. Significant decline. High priority for conservation action.

*Eviota nigripinna* Lachner & Karnella, 1980 – Blackfin pygmy goby
Taxonomy. Originally described in part from Réunion by Lachner & Karnella (1980: 37–39); record confirmed by Fricke (1999: 509), based on BPBM and SMNS material.
Distribution. Réunion, Mauritius, Comores, Agalega Islands. Marine species. Found among live corals in exposed reefs, at depths of 0–10 m. Outside the area, Maldives and Chagos Archipelago. Endemic to islands in the western and central Indian Ocean.
Conservation. Endangered in Réunion (EN). Threats: HOS, HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action.

*Eviota prasina* (Klunzinger, 1871) – Green bubble goby
Taxonomy. First record from Réunion by Fricke (1999: 509–510), based on SMNS material; previously listed as *E. verna* by Harmelin-Vivien (1976: 100).
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Agalega Islands, Amirantes, Seychelles, Cargados Carajos. Marine species. Found on coralline rock of reef flats, lagoon and seaward reefs, at depths of 0–65 m, including tidal pools. Outside the area, Red Sea and East Africa east to Palau/Belau and Tuamotu Islands, north to southern Japan and Ogasawara Islands, south to Western Australia, Lord Howe Island, and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Eviota sebreei* Jordan & Seale, 1906 – Striped pygmy goby
Taxonomy. First record from Réunion by Fricke (1999: 510), based on SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Aldabra, Amirantes, Seychelles, Cargados Carajos. Marine species. Found on and among live corals in exposed reefs, at depths of 0.5–6 m. Outside the area, Red Sea east to Marshall and Samoan islands, north to Ryukyu Islands, south to Western Australia, Queensland/Australia, New Caledonia and Tonga.
Conservation. Endangered in Réunion (EN). Threats: HOS, HAB, EUT. Rare. Very sensitive to human activities. Significant decline. High priority for conservation action.

*Fusigobius maximus* (Randall, 2001) – Larger fusegoby
Taxonomy. **New record** from Réunion, based on SMNS 21017 (1) and SMNS 21174 (1); previously listed by Harmelin-Vivien (1976: 100) as *Fusigobius neophytus* (non Günther, 1877), and by Fricke (1999: 506) as *Coryphopterus neophytus* (non Günther, 1877).
Distribution. Réunion, Mauritius, Comores, Madagascar, Aldabra, Seychelles. Marine species. Found in coral reef lagoon habitats, at depths of 0–21 m. Outside the area, southern Red Sea, Oman and Sri Lanka east to eastern Indonesia, Philippines and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Glossogobius giuris* (Hamilton, 1822) – Tank goby; Loche, gobie (Réunion)
Taxonomy. First record from Réunion by Bleeker (1874: 77) as *Gobius giuris*; record confirmed as *Glossogobius giuris* by Fricke (1999: 511–512), based on MHNRUN and MNHN material.
Distribution. Réunion, Mauritius, Madagascar, Seychelles. Freshwater, transitional water and marine. Found mainly in freshwater and estuaries, but may enter the sea; also found in canals, ditches and ponds, in clear to turbid streams with rock, gravel or sand bottoms. Outside the area, southern Red Sea, East and South Africa east to Society Islands, north to Philippines, south to Western Australia, New South Wales/Australia and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT, CON. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Glossogobius kokius* (Valenciennes [ex Russell] in Cuvier & Valenciennes, 1837)
Taxonomy. First record from Réunion by Guichenot (1863: C27) as *Gobius kokius*. May be conspecific with *Glossogobius giuris*.
Distribution. Réunion, Mauritius. Freshwater, transitional water and marine. Found mainly in freshwater and estuaries, but also enters the sea. Outside the area, India.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT, CON. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Gnatholepis anjerensis* (Bleeker, 1851) – Anjer goby
Taxonomy. First record from Réunion by Fricke (1999: 512–513), based on LEMUR, MNHN and SMNS material. Taxonomic decision of Randall & Greenfield (2007: 3–6).
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Amirantes, Seychelles. Transitional water and marine. Found in shallow coastal bays and estuaries on silty sandy substrates, including coral reef lagoons, with sparse algae or seagrass, at depths of 0–26 m. Outside the area, Red Sea, East and South Africa east to Hawaiian, Marquesas and Tuamotu islands, north to Ryukyu and Ogasawara islands, south to Rowley Shoals/Western Australia, Lord Howe Island and Rapa.
Conservation. Least concern in Réunion (LC). Threats: HAB, EUT. Sensitive to human activities. Stable populations. Low priority for conservation action.

*Gnatholepis cauerensis* (Bleeker, 1853) – Eyebar goby, shoulderspot goby
Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 100) as *Acentrogobius cauerensis*; subsequently listed by Fricke (1999: 512–513) as *Gnatholepis scapulostigma*, based on SMNS material.
Distribution. Réunion, Rodrigues, Comores, Agalega Islands. Marine species. Found in sheltered sandy areas from reef flats and lagoons to seaward coral reefs; over sandy bottoms near pieces of rubble, rock, or coral, at depths of 0–30 m. Outside the area, South and East Africa east to Wake, Marshall, Line and Gambier islands, north to Ogasawara Islands, south to Western Australia, Lord Howe Island and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Gobiodon citrinus* (Rüppell, 1838) – Lemon coral goby
Taxonomy. First record from Réunion by Harmelin-Vivien

(1976: 100); record confirmed by FRICKE (1999: 514), based on MNHN and SMNS material.
Distribution. Réunion, Aldabra, Seychelles. Marine species. Found associated with colonies of broadly branched corals (*Acropora* spp.), at depths of 0–8 m. Outside the area, Red Sea and East and South Africa east to Samoa and Tonga, north to southern Japan, south to Western Australia, Queensland/Australia and New Caledonia.
Conservation. Endangered in Réunion (EN). Threats: HOS, HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action. Proposed for Annex II of the EU Habitats Directive.

*Gobiodon rivulatus* (Rüppell, 1830) – Rippled coral goby
Taxonomy. First record from Réunion by HARMELIN-VIVIEN (1976: 100); record confirmed by FRICKE (1999: 514), based on SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Freshwater, transitional water and marine. Found associated with tabletop *Acropora* corals but also recorded from pools, freshwater streams or lagoon mouths; at depths of 0–8 m. Outside the area, Red Sea, East and South Africa east to Wake and Gambier islands, north to Ryukyu Islands, south to New Caledonia.
Conservation. Endangered in Réunion (EN). Threats: HOS, HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action. Proposed for Annex II of the EU Habitats Directive.

*Hetereleotris apora* (Hoese & Winterbottom, 1979) – Poreless goby
Taxonomy. First record from Réunion by FRICKE (1999: 514), based on SMNS material.
Distribution. Réunion, Mauritius, Comores, Cargados Carajos. Marine species. Found associated with volcanic rocks, mainly in tidal rockpools, at depths of 0–3 m. Outside the area, South Africa to Chagos Archipelago.
Conservation. Data deficient in Réunion (DD). Threats: EUT, CON. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Hetereleotris georgegilli* Gill, 1998 – Gill's goby
Taxonomy. First record from Réunion by FRICKE (1999: 515), based on SMNS material.
Distribution. Réunion, Mauritius, Rodrigues. Marine species. Found associated with volcanic rocks, including tidal rockpools, at depths of 0–10 m. Endemic to Mascarenes.
Conservation. Data deficient in Réunion (DD). Threats: EUT, CON. Local importance. Rare. Sensitive to human activities. Probable decline. High priority for conservation action.

*Hetereleotris kenyae* Smith, 1958 – Kenya goby
Taxonomy. First record from Réunion by FRICKE (1999: 515), based on SMNS material.
Distribution. Réunion. Marine species. Found associated with coralline rock in lagoon reefs, including the reef flat, at depths of 0–5 m. Outside the area, East Africa.
Conservation. Data deficient in Réunion (DD). Threats: EUT, CON. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Hetereleotris margaretae* Hoese, 1986 – Smoothscale goby
Taxonomy. First record from Réunion by FRICKE (1999: 515), based on SMNS material.
Distribution. Réunion. Marine species. Found associated with coralline rock in lagoon reefs, including the reef flat, at depths of 0–5 m. Outside the area, Sodwana Bay/South Africa.
Conservation. Data deficient in Réunion (DD). Threats: EUT, CON. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Hetereleotris zanzibarensis* (Smith, 1958) – Goggle goby
Taxonomy. First record from Réunion by FRICKE (1999: 516), based on SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Seychelles, Cargados Carajos. Marine species. Found associated with coralline rock in lagoon reefs, including the reef flat, at depths of 0–4 m. Outside the area, East Africa east to Maldives.
Conservation. Data deficient in Réunion (DD). Threats: EUT, CON. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Istigobius decoratus* (Herre, 1927) – Decorated goby
Taxonomy. First record from Réunion by LETOURNEUR (1991: 164); record confirmed by FRICKE (1999: 516–517), based on LEMUR, SMNS and USNM material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles, Cargados Carajos. Marine species. Found on sand of clear lagoon and seaward coral and rocky reefs, at depths of 0–20 m. Outside the area, Red Sea and East Africa east to Rotuma and Tonga, north to southern Japan, south to Lord Howe Island.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

?*Myersina filifer* (Valenciennes in Cuvier & Valenciennes, 1837) – Filamentous goby
Taxonomy. First record from Réunion as *Gobius filifer* by GUICHENOT (1863: C27); recorded as *Cryptocentrus filifer* by FRICKE (1999: 507). The record from Réunion needs confirmation according to WINTERBOTTOM (2002: 70).
Distribution. Réunion. Marine species. Found on soft bottoms. Outside the area, Arabian/Persian Gulf east to Pakistan, southern China north to Korea and Japan.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Decline unknown. Low priority for conservation action.

**Oxyurichthys guibei* Smith, 1959 – Guibé's goby
Taxonomy. First record from Réunion by FRICKE (1999: 517), based on MNHN holotype which was erroneously described by SMITH (1959a: 215) from Mauritius.
Distribution. Réunion. Transitional water and marine. Found on soft bottoms adjacent to coral reefs, including estuaries. Endemic to Réunion.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Global importance. Rare. Sensitive to human activities. Probable decline. High priority for conservation action.

*Paragobiodon echinocephalus* (Rüppell, 1830) – Redhead coral goby
Taxonomy. First record from Réunion by HARMELIN-VIVIEN (1976: 100).
Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Found among branches of live *Stylophora* coral, at depths of 0–10 m. Outside the area, Red Sea east to Tuamotu and Marquesas islands, north to Ryukyu Islands, south to Queensland/Australia, Lord Howe Island, and Tonga.
Conservation. Endangered in Réunion (EN). Threats: HOS,

HAB, EUT. Rare. Very sensitive to human activities. Significant decline. High priority for conservation action. Proposed for Annex II of the EU Habitats Directive.

*Paragobiodon modestus* (Regan, 1908) – Warthead goby
Taxonomy. First record from Réunion by FRICKE (1999: 518), based on SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Aldabra, Farquhar Islands, Seychelles. Marine species. Found among the branches of live *Pocillopora* corals, at depths of 0–9 m. Outside the area, East Africa east to Marshall and Society islands, north to Ryukyu Islands, south to Lord Howe Island.
Conservation. Endangered in Réunion (EN). Threats: HOS, HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action. Proposed for Annex II of the EU Habitats Directive.

*Periophthalmus kalolo* Lesson, 1831 – Common mudskipper; Cabot (Réunion)
Taxonomy. First record from Réunion by LETOURNEUR et al. (2004: 205).
Distribution. Réunion, Mauritius, Madagascar. Transitional water or marine. Amphibious air-breather that spends most of its time out of the water; able to meet its oxygen requirements as long as it stays wet; typically resting on mud, or rocks, with their tails dipped in the water; at depths of 0–2 m. Outside the area, East Africa east to Samoa.
Conservation. Endangered in Réunion (EN). Threats: HAB, EUT, CON. Very sensitive to human activities. Significant decline. High priority for conservation action. Proposed for Annex II of the EU Habitats Directive.

*Pleurosicya micheli* Fourmanoir, 1971 – Michel's ghost goby
Taxonomy. First record from Réunion by FRICKE (1999: 519), based on SMNS material.
Distribution. Réunion, Amirantes. Marine species. Found on live hard corals, sometimes on the mantle of clams, and eggs are usually laid on ascidians, at depths of 1–38 m. Outside the area, east to Hawaiian Islands and Tonga, north to southern Japan, south to New Caledonia.
Conservation. Endangered in Réunion (EN). Threats: HOS, HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action.

*Priolepis cinctus* (Regan, 1908) – Girdled goby, convict goby
Taxonomy. First record from Réunion by FRICKE (1999: 520 as *Priolepis cincta*), based on SMNS and USNM material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Agalega Islands, Aldabra, Farquhar Islands, Seychelles. Transitional water and marine. Found in caves and crevices, also among corals or rock, at depths of 0–78 m. Outside the area, Red Sea east to Fiji and Tonga, north to southern Japan and Ogasawara Islands, south to Western Australia, Elizabeth and Middleton reefs, and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Priolepis semidoliata* (Valenciennes in Cuvier & Valenciennes, 1837) – Half-barred goby
Taxonomy. First record from Réunion by WINTERBOTTOM & BURRIDGE (1993: 508–511); record confirmed by FRICKE (1999: 521), based on SAIAB and SMNS material.
Distribution. Réunion, Mauritius, Comores, Agalega Islands, Seychelles. Marine species. Found in caves and crevices, also among corals or rock, at depths of 0–30 m. Outside the area, Red Sea east to Wake Atoll and Pitcairn Group, south to Western Australia, Norfolk, Tongan and Austral islands.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Sicyopterus lagocephalus* (Pallas, 1770) – Bichique; Cabot lézard, cabot à bouche ronde, bichique
Taxonomy. First record from Réunion as *Sicydium lagocephalum* by VALENCIENNES in CUVIER & VALENCIENNES (1837: 174–176); previously described as *Gobius caeruleus* Lacepède [ex Commerson], 1800 by LACEPÈDE (1800: 537, 560–561); also described as *Sicydium laticeps* Valenciennes (VALENCIENNES in CUVIER & VALENCIENNES 1837: 177); record confirmed by FRICKE (1999: 522–523), based on MHNRUN and MNHN material. SMITH & SPARKS (2007: 103–107) proposed to suppress the name *Gobius lagocephalus* Pallas, 1770; this proposal was objected by KOTTELAT et al. (2008: 57–60) and others.
Distribution. Réunion, Mauritius, Comores, Madagascar. Freshwater, transitional water and marine. Found in fast-flowing sections of clear rainforest streams over rocky bottoms, up to 800 m altitude; hatching in freshwater, larval stage migrating to sea, postlarval stage to adult in freshwater. Outside the area, on islands east to French Polynesia.
Conservation. Endangered in Réunion (EN). Threats: FIT, HAB, EUT, CON. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Stenogobius polyzona* (Bleeker, 1867) – Chinestripe goby; Cabot rayé (Réunion)
Taxonomy. First record from Réunion as *Gobius polyzona* by BLANC & POSTEL (1958: 370); record confirmed by FRICKE (1999: 523), based on MHNRUN and MNHN material.
Distribution. Réunion, Mauritius, Madagascar. Freshwater, transitional water and marine. Found in freshwater streams and rivers, preferring estuaries and slow-flowing water; hatching and larval stages occur at sea. Outside the area, endemic to islands in the southwestern Indian Ocean.
Conservation. Endangered in Réunion (EN). Threats: HAB, EUT, CON. Very sensitive to human activities. Significant decline. High priority for conservation action. Proposed for Annex II of the EU Habitats Directive.

*Stonogobiops dracula* Polunin & Lubbock, 1977 – Dracula shrimp-goby
Taxonomy. **New record** from Réunion, based on specimens observed and photographed during a visual census, at Saint-Paul, at 40 m depth, in Aug. 2008 (A. DIRINGER, T. MULOCHAU, P. DURVILLE, T. CADET).
Distribution. Réunion, Seychelles. Marine species. Found on sand and rubble bottoms adjacent to coral reefs, in symbiosis with the alpheid shrimp *Alpheus randalli*, at depths of 15–37 m. Outside the area, Maldives.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Valenciennea helsdingenii* (Bleeker, 1858) – Twostripe goby, railway glider
Taxonomy. First record from Réunion by FRICKE (1999: 523).
Distribution. Réunion, Mauritius. Marine species. Found singly but usually in pairs over silty flat sand patches, or rubble substrates, on outer reefs at the bottom of coral or rocky drop-offs, rarely in lagoons, at depths of 1–45 m. Outside the area, East and South Africa east to Line and Marquesas is-

lands, north to southern Japan, south to New South Wales/ Australia and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Valenciennea sexguttata* (Valenciennes in Cuvier & Valenciennes, 1837) – Sixspot goby, ladder glider
Taxonomy. First record from Réunion by Letourneur (1992: 53); previously described from Réunion as *Eleotris lantzii* by Thominot (1878: 256); record confirmed by Fricke (1999: 524), based on MNHN material.
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Aldabra, Agalega Islands, Farquhar Islands, Seychelles, Cargados Carajos. Marine species. Found in silty or sandy areas of lagoons and bays, usually in pairs and lives in a burrow under rocks, at depths of 0–10 m. Outside the area, Red Sea and East Africa east to Samoa and Tonga, north to Yaeyama and Ryukyu islands, south to Western Australia and Queensland/Australia.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Valenciennea strigata* (Broussonet [ex Forster], 1782) – Blue-streak goby, pennant glider
Taxonomy. First record from Réunion by Chabanet (1994: 241).
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles, Cargados Carajos. Marine species. Found in clear outer lagoon and seaward coral or rocky reefs, over hard bottoms as well as over sand and rubble; usually in pairs, hovering near their burrow; at depths of 0–24 m. Outside the area, South and East Africa east to Line, Society and Marquesas islands, north to southern Japan, south to Western Australia, Lord Howe Island, and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Vanderhorstia ornatissima* Smith, 1959 – Ornate prawn-goby
Taxonomy. **New record** from Réunion, based on specimens observed and photographed during a visual census, in the inner and outer coral reef, in 2006 (A. Diringer, T. Mulochau, P. Durville, T. Cadet).
Distribution. Réunion, Aldabra, Seychelles. Marine species. Found on sandy areas among seagrass and in silty lagoons amongst rubble, in symbiosis with alpheid shrimps, at depths of 0–15 m. Outside the area, East Africa east to Marquesas Islands, north to southern Japan, south to Rapa.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

## Microdesmidae – Microdesmids

*Gunnellichthys curiosus* Dawson, 1968 – Curious wormfish
Taxonomy. **New record** from Réunion, based on specimens observed and photographed during a visual census, on the outer and inner coral reef, in Aug. 2008 (A. Diringer, T. Mulochau, P. Durville, T. Cadet).
Distribution. Réunion, Seychelles. Marine species. Found over sand and rubble slopes or mud bottoms, takes refuge in burrows, at depths of 9–60 m. Outside the area, East Africa east to Hawaiian and Society islands.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Nemateleotris decora* Randall & Allen, 1973 – Elegant firefish
Taxonomy. **New record** from Réunion, based on specimens observed and photographed during a visual census, on the outer coral reef, in 2006 (A. Diringer, T. Mulochau, P. Durville).
Distribution. Réunion, Mauritius. Marine species. Found on sand and rubble bottom adjacent to coral reefs, at depths of 25–70 m. Outside the area, east to Samoa, north to Ryukyu Islands, south to New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Nemateleotris magnifica* Fowler, 1938 – Fire goby, fire dartfish
Taxonomy. First record from Réunion as *Nemateleotris magnificus* by Harmelin-Vivien (1976: 100); record confirmed by Fricke (1999: 525–526), based on SAIAB material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Agalega Islands, Seychelles. Marine species. Found in upper portions of outer coral or rocky reef slopes; hovers above the bottom at depths of 6–70 m. Outside the area, South and East Africa east to Hawaiian Islands and Pitcairn Group, north to southern Japan and Ogasawara Islands, south to Western Australia, New Caledonia and Austral Islands.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Ptereleotris evides* (Jordan & Hubbs, 1925) – Blackfin dartfish, scissortail
Taxonomy. First record from Réunion by Randall & Hoese (1985: 11–13); previously listed as *Ptereleotris tricolor* by Harmelin-Vivien (1976: 101); record confirmed by Fricke (1999: 526), based on BPBM material.
Distribution. Réunion, Mauritius, Comores, Agalega Islands, Amirantes, Seychelles, Cargados Carajos. Marine species. Found in outer coral or rocky reef slopes, also inhabits lagoons and bays; hovers 1–2 m above the bottom at depths of 2–15 m. Outside the area, Red Sea, East and South Africa east to Wake Atoll and Oeno/Pitcairn Group, north to southern Japan and Ogasawara Islands, south to Western Australia, New South Wales/Australia, Lord Howe Island and Rapa.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Ptereleotris heteroptera* (Bleeker, 1855) – Dartfish
Taxonomy. First record from Réunion by Randall & Hoese (1985: 16–17); record confirmed by Fricke (1999: 526), based on BPBM material.
Distribution. Réunion, Mauritius, Seychelles. Marine species. Found in lagoons or bays, in passes, or on outer coral or rocky reef slopes; over hard substrate as well as patches of rubble or sand, usually at the base of the reef, at depths of 3–46 m. Outside the area, Red Sea, East and South Africa east to Society and Marquesas islands, north to southern Japan and Ogasawara Islands, south to New South Wales/ Australia, New Caledonia and Tonga.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Ptereleotris zebra* (Fowler, 1938) – Zebra dartfish
Taxonomy. First record from Réunion by FRICKE (1999: 527).
Distribution. Réunion, Mauritius, Seychelles. Marine species. Found in exposed seaward coral reefs in relatively shallow water, over hard bottoms, at depths of 2–31 m. Outside the area, Red Sea and East Africa east to Line and Marquesas islands, north to southern Japan and Ogasawara Islands, south to New South Wales/Australia and Lord Howe Island.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

## Xenisthmidae – Wrigglers

*Xenisthmus africanus* Smith, 1958 – Flathead wriggler
Taxonomy. First record from Réunion by HARMELIN-VIVIEN (1976: 101).
Distribution. Réunion, Aldabra, Cargados Carajos. Marine species. Found on the sandy fringe of coral reefs, at depths of 2–10 m. Outside the area, Red Sea and East Africa east to Philippines and New Guinea.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

## Ephippidae – Batfishes

*Platax orbicularis* (Forsskål in Niebuhr, 1775) – Orbicular batfish, circular spadefish
Taxonomy. First record from Réunion by MAUGÉ & HEEMSTRA (1984: 2 unnumbered pp.); previously listed as *P. blochii* by GUICHENOT (1863: C26), and as *P. vespertilio* by BLEEKER (1874: 94); record of *P. orbicularis* confirmed by FRICKE (1999: 528–529), based on MHNRUN material.
Distribution. Réunion, Mauritius, Comores, Madagascar, Aldabra, Seychelles. Transitional water and marine. Found in shallow protected coastal waters to deep, somewhat silty habitats; juveniles occur singly or in small groups among inner sheltered lagoons while adults move out to open waters over sandy areas of deep lagoons, channels, and seaward coral reefs; at depths of 0–30 m. Outside the area, Red Sea, East and South Africa east to Tuamotu Archipelago, north to southern Japan, south to Western Australia, New Caledonia, and Tonga. Introduced into West Atlantic waters off Florida, USA.
Conservation. Data deficient in Réunion (DD). Threats: FIB, HAB, EUT, CON. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Platax pinnatus* (Linnaeus, 1758) – Dusky batfish
Taxonomy. First record from Réunion by FRICKE (1999: 529), based on MHNRUN material.
Distribution. Réunion, Mauritius, Madagascar, Aldabra, Cargados Carajos. Transitional water and marine. Adults are found solitary, under overhangs of steep outer coral reef slopes; juveniles among inner sheltered reefs where they seek shelter in caves or under ledges; at depths of 2–30 m. Outside the area, east to Solomon Islands.
Conservation. Extinct in Réunion (RE), according to LETOURNEUR et al. (2004: 212). Threats: FIT, FIB, HAB, EUT, CON. Sensitive to human activities. High priority for conservation action.

*Platax teira* (Forsskål in Niebuhr, 1775) – Longfin batfish, longfin spadefish
Taxonomy. First record from Réunion by CHABANET (1994: 239); record confirmed by FRICKE (1999: 529–530), based on MHNRUN material.
Distribution. Réunion, Mauritius, Madagascar. Transitional water and marine. Adults are found in sheltered bays as well as deep offshore, associated with coral reefs; juveniles with floating debris and form aggregations; at depths of 0–20 m. Outside the area, Red Sea, East and South Africa east to Northern Marianas, Solomon and Loyalty islands, north to southern Japan and Ogasawara Islands, south to Western Australia, Queensland/Australia and Norfolk Island.
Conservation. Data deficient in Réunion (DD). Threats: FIB, HAB, EUT, CON. Sensitive to human activities. Probable decline. Medium priority for conservation action.

## Siganidae – Spinefeet, rabbitfishes

*Siganus argenteus* (Quoy & Gaimard, 1825) – Silver rabbitfish, streamlined spinefoot; Sigan vermiculé
Taxonomy. First record from Réunion by WOODLAND (1984b: 2 unnumbered pp.).
Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Aldabra. Marine species. Found on coastal and inner reef slopes and lagoons, at depths of 0–40 m. Outside the area, Red Sea and East Africa east to Wake Atoll and Pitcairn, north to southern Japan and Ogasawara Islands, south to Western Australia, Queensland/Australia, New Caledonia and Rapa.
Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Siganus laqueus* Bonde, 1934 – Star-spotted rabbitfish, brown-spotted spinefoot; Sigan marguerite
Taxonomy. First record from Réunion as *S. stellatus laqueus* by FRICKE (1999: 531); previously listed as *S. stellatus* (non Forsskål in Niebuhr, 1775) by WOODLAND (1984b: 2 unnumbered pp.).
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Amirantes, Seychelles. Transitional water and marine. Found in coral reefs; juveniles enter weedy estuaries; at depths of 0–15 m. Outside the area, South and East Africa east to Singapore.
Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Rare. Very sensitive to human activities. Probable decline. Medium priority for conservation action.

*Siganus luridus* (Rüppell [ex Ehrenberg], 1829) – Squaretail rabbitfish, dusky spinefoot; Marguerite du large (Réunion), sigan sombre (France)
Taxonomy. First record from Réunion as *Amphacanthus luridus* by GUICHENOT (1863: C27); subsequently described as *Siganus spinus* (non Linnaeus, 1758) by FOURMANOIR & GUÉZÉ (1961b: 13–14, fig. 7); record of *S. luridus* confirmed by FRICKE (1999: 530–531), based on BPBM and MHNRUN material.
Distribution. Réunion, Mauritius, Comores, Madagascar. Marine species. Found on hard bottom of compacted sand with rock or coral debris associated with coral reefs, at depths of 0–40 m. Outside the area, Red Sea and East Africa, recently immigrated into eastern Mediterranean through Suez Canal.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Siganus sutor* (Valenciennes in Cuvier & Valenciennes, 1835) – African white-spotted rabbitfish, shoemaker spinefoot; Sigan cordonnier

Taxonomy. Originally described in part from Réunion as *Amphacanthus sutor* by Valenciennes in Cuvier & Valenciennes (1835: 148–150); subsequently listed as *Teuthis fuscescens* (non Houttuyn, 1782) by Bleeker (1874: 96), and as *Siganus oramin* (non Schneider in Bloch & Schneider, 1801) by Blanc & Postel (1958: 369); record of *S. sutor* confirmed by Fricke (1999: 532–533), based on LEMUR and MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Marine species. Found in inshore areas and inner reefs, often among seagrass, at depths of 5–50 m. Outside the area, Gulf of Aden, East and South Africa east to Chagos Archipelago.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

## Zanclidae – Moorish idols

*Zanclus cornutus* (Linnaeus, 1758) – Moorish idol; Cocher blanc

Taxonomy. First record from Réunion as *Chaetodon cornutus* by Lacepède (1802: 453, 471–477); subsequently recorded as *Zanclus canescens* by Letourneur (1991: 164); record confirmed by Fricke (1999: 533–534), based on LEMUR, MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Agalega Islands, Seychelles. Marine species. Found in turbid inner lagoons, reef flats, and clear seaward rocky and coral reefs, at depths of 3–182 m. Outside the area, East and South Africa east to Panama, north to southern Japan and Ogasawara Islands, south to Western Australia, Lord Howe and Kermadec islands, and Rapa.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

## Acanthuridae – Surgeonfishes, unicornfishes

*Acanthurus blochii* Valenciennes in Cuvier & Valenciennes, 1835 – Tailring surgeonfish

Taxonomy. First record from Réunion by Letourneur (1991: 164); previously listed as *A. annularis* by Guichenot (1863: C27).

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Aldabra. Marine species. Found in outer lagoon and seaward coral reefs, at depths of 1–12 m. Outside the area, Red Sea, East and South Africa east to Hawaiian and Society islands, north to Ryukyu and Ogasawara islands, south to Lord Howe Island.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Very sensitive to human activities. Decline unknown. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté nº 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Acanthurus dussumieri* Valenciennes in Cuvier & Valenciennes, 1835 – Eyestripe surgeonfish

Taxonomy. First record from Réunion by Randall (1984: 2 unnumbered pp.); record confirmed by Fricke (1999: 535–536), based on MHNRUN material.

Distribution. Réunion, Mauritius, Madagascar, Aldabra, Seychelles. Marine species. Found in deep coastal reef slopes and outer reef walls, juveniles in algae on rocky reefs; at depths of 4–131 m. Outside the area, East and South Africa east to Hawaiian and Line islands, north to southern Japan and Ogasawara Islands, south to Rowley Shoals/Western Australia, Lord Howe Island and New Caledonia.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Decline unknown. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté nº 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Acanthurus guttatus* Bloch & Schneider [ex Forster], 1801 – White-spotted surgeonfish

Taxonomy. First record from Réunion by Guichenot (1863: C27); record confirmed by Fricke (1999: 536), based on MHNRUN material.

Distribution. Réunion, Mauritius, Rodrigues. Marine species. Found in the surge zone of clear seaward coral reefs, at depths of 0–6 m. Outside the area, Maldives and Chagos Archipelago east to Hawaiian, Marquesas and Tuamotu islands, north to Ryukyu Islands, south to New Caledonia and Rapa.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Very sensitive to human activities. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté nº 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Acanthurus leucosternon* Bennett, 1833 – Powder-blue surgeonfish

Taxonomy. First record from Réunion by Fourmanoir & Guézé (1962b: 9); record confirmed by Fricke (1999: 536–537), based on observations by P. Durville and E. Tessier.

Distribution. Réunion, Mauritius, Comores, Madagascar, Aldabra, Seychelles. Marine species. Found in clear coral reefs, usually found on reef flats and along upper seaward slopes, at depths of 0–25 m. Outside the area, East and South Africa east to Indonesia.

Conservation. Endangered in Réunion (EN). Threats: FIT, HAB, EUT. Rare. Very sensitive to human activities. Significant decline. High priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté nº 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Acanthurus lineatus* (Linnaeus, 1758) – Lined surgeonfish

Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 101); record confirmed by Fricke (1999: 537), based on a visual record (at Boucan-Canot, 1999).

Distribution. Réunion, Mauritius, Europa Island, Comores, Madagascar, Aldabra, Seychelles. Marine species. Found in clear coral reefs, usually found on reef flats and along upper seaward slopes, at depths of 0–25 m. Outside the area, East and South Africa east to Hawaiian, Marquesas and Tuamotu islands, north to southern Japan and Ogasawara Islands, south to southern Great Barrier Reef/Australia and New Caledonia.

Conservation. Endangered in Réunion (EN). Threats: FIT, HAB, EUT. Rare. Very sensitive to human activities. Significant decline. High priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté nº 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Acanthurus mata* Russell in Cuvier, 1829 – Elongate surgeonfish

Taxonomy. First record from Réunion as *A. mataa* by Harmelin-Vivien (1976: 101); subsequently recorded as *A. bleekeri* by Randall (1984: 2 unnumbered pp.); record confirmed by Fricke (1999: 534, 538) as *A. bleekeri* and *A. mata*.

Distribution. Réunion, Mauritius, Madagascar. Marine species. Found on steep slopes, often in turbid waters, generally in the vicinity of coral reefs or rocky bottoms, at depths of 3–100 m. Outside the area, Red Sea, East and South Africa east to Tuamotu and Marquesas islands, north to southern Japan and Ogasawara Islands, south to Queensland/Australia and New Caledonia.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Decline unknown. Low priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté nº 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Acanthurus nigricauda* Duncker & Mohr, 1929 – Epaulette surgeonfish

Taxonomy. First record from Réunion by Letourneur (1991: 164); previously recorded as *Acanthurus gahm* (non Forsskål in Niebuhr, 1775) and *A. nigricans* (non Linnaeus, 1758) by Fourmanoir & Guézé (1962b: 9); record confirmed by Fricke (1999: 538–539), based on MHNRUN material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Marine species. Found in clear lagoon and seaward coral and rocky reefs around isolated coral heads; prefers sandy bottoms of bays and lagoons, at depths of 0–30 m. Outside the area, East and South Africa east to Tuamotu Islands, north to Ryukyu Islands, south to Queensland/Australia.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Decline unknown. Low priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté nº 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Acanthurus nigrofuscus* (Forsskål in Niebuhr, 1775) – Dusky surgeonfish

Taxonomy. First record from Réunion by Valenciennes in Cuvier & Valenciennes (1835: 214–215); subsequently recorded as *A. orbicularis* (non Valenciennes [ex Quoy & Gaimard] in Cuvier & Valenciennes, 1835) by Guichenot (1863: C27), as *A. lineolatus* by Fourmanoir & Guézé (1962b: 9), and as *A. elongatus* by Harmelin-Vivien (1976: 101); record confirmed by Fricke (1999: 539–540), based on LEMUR, MHNRUN, MNHN and SMNS material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles. Marine species. Found on hard substrates of shallow lagoon and seaward coral and rocky reefs, at depths of 0–25 m. Outside the area, Red Sea, East and South Africa east to Hawaiian and Tuamotu islands, north to southern Japan and Ogasawara Islands, south to Lord Howe Island, New Caledonia and Rapa.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Decline unknown. Low priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté nº 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Acanthurus polyzona* (Bleeker, 1868) – Black-barred surgeonfish

Taxonomy. Originally described in part from Réunion by Bleeker (1868c: 277–278) as *Rhombotides polyzona*; record confirmed by Fricke (1999: 540–541), based on BPBM, MNHN, SMNS and USNM material.

Distribution. Réunion, Mauritius, Rodrigues, Mayotte, Madagascar. Marine species. Found on rocky reefs subjected to cool upwelling waters, including tidal pools, at depths of 0–10 m. Endemic to islands in the southwestern Indian Ocean.

Conservation. Near threatened in Réunion (NT). Threats: FIT, HAB, EUT. Local importance. Sensitive to human activities. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté nº 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Acanthurus tennentii* Günther, 1861 – Lieutenant surgeonfish, doubleband surgeonfish

Taxonomy. First record from Réunion by Randall (1984: 2 unnumbered pp.); previously recorded as *A. olivaceus* (non Bloch & Schneider [ex Forster], 1801) by Fourmanoir & Guézé (1962b: 9).

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles. Marine species. Found in lagoon and seaward coral and rocky reefs, at depths of 1–25 m. Outside the area, Red Sea, East and South Africa east to Sri Lanka and western Indonesia.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté nº 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Acanthurus thompsoni* (Fowler, 1923) – Chocolate surgeonfish

Taxonomy. First record from Réunion by Letourneur (1998: 283).

Distribution. Réunion, Mauritius, Seychelles. Marine species. Found on steep outer coral and rocky reef slopes and drop-offs, over coral and sand, at depths of 4–119 m. Outside the area, East and South Africa east to Hawaiian, Marquesas and Ducie islands, north to southern Japan and Ogasawara Islands, south to New Caledonia and Rapa.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté nº 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Acanthurus triostegus* (Linnaeus, 1758) – Convict surgeonfish; Cordonnier (Réunion)

Taxonomy. First record from Réunion by Guichenot (1863: C27); record confirmed by Fricke (1999: 542–543), based on LEMUR, MHNRUN, MNHN, SMNS and USNM material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Agalega Islands, Seychelles, Cargados Carajos. Marine species. Found in lagoon and seaward reefs with hard substrate; juveniles abundant in tide pools; at depths of 0–90 m. Outside the area, East Africa east to Pan-

ama, north to southern Japan and Ogasawara Islands, south to Lord Howe, Kermadec, Rapa and Ducie islands.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Decline unknown. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Acanthurus xanthopterus* Valenciennes in Cuvier & Valenciennes, 1835 – Yellowfin surgeonfish; Chirurgien (Réunion)

Taxonomy. First record from Réunion by Guichenot (1863: C27); also described as *A. gahmoides* by Guichenot (1863: C8–C9, C27); subsequently listed as *A. matoides* by Bleeker (1874: 97), and *A. fuliginosus* by Fourmanoir & Guézé (1962b: 9); record confirmed by Fricke (1999: 543–544), based on MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Aldabra, Seychelles. Marine species. Found in various coral reef habitats, sand slopes and lagoons, at depths of 0–100 m. Outside the area, Red Sea, East and South Africa east to Panama, north to southern Japan and Ogasawara Islands, south to Queensland/Australia.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Ctenochaetus striatus* (Quoy & Gaimard, 1825) – Striated surgeonfish

Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 101); record confirmed by Fricke (1999: 544–545), based on LEMUR, MNHN and USNM material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles. Marine species. Found on reef flats and in lagoon and seaward reefs, over coral, rock, pavement, or rubble substrates, at depths of 3–30 m. Outside the area, Red Sea and East Africa east to Tuamotu Archipelago, north to southern Japan and Ogasawara Islands, south to southern Great Barrier Reef/Australia and Rapa.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Ctenochaetus truncatus* Randall & Clements, 2001 – Goldring bridletooth

Taxonomy. First record from Réunion by Randall & Clements (2001: 25); previously recorded as *Acanthurus strigosus* (non Quoy & Gaimard, 1825) by Bleeker (1874: 96); record confirmed by Fricke (1999: 545) as *Ctenochaetus strigosus* (non Quoy & Gaimard, 1825), based on MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra. Marine species. Found among inner reef crests and slopes, usually near large coral heads or in gutters, at depths of 1–21 m. Outside the area, East and South Africa east to Indonesia.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Naso brachycentron* (Valenciennes in Cuvier & Valenciennes, 1835) – Humpback unicorn

Taxonomy. First record from Réunion by Letourneur (1998: 283); previously recorded as *N. rigoletto* by Harmelin-Vivien (1976: 101).

Distribution. Réunion, Mauritius. Marine species. Found in deep coral reef, on seaward coral reef slopes, and on rocky shores, at depths of 1–20 m. Outside the area, East and South Africa east to Marquesas and Society islands, north to southern Japan, south to northern Australia, New Caledonia and Tonga.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Naso brevirostris* (Cuvier, 1829) – Spotted unicornfish, palefin unicornfish

Taxonomy. First record from Réunion by Guichenot (1863: C27) as *Naseus brevirostris*; record confirmed by Fricke (1999: 546), based on MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Agalega Islands, Seychelles. Marine species. Found benthopelagic along steep seaward reef drop-offs, also along rocky shores, at depths of 1–122 m. Outside the area, Red Sea, East and South Africa east to Galapagos Archipelago, north to southern Japan and Ogasawara Islands, south to Lord Howe Island.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Naso elegans* (Rüppell, 1829) – Indian Ocean orangespine unicornfish

Taxonomy. **New record** from Réunion; previously listed as *N. lituratus* (non Bloch & Schneider [ex Forster], 1801) by Fourmanoir & Guézé (1962b: 9); record confirmed as *N. lituratus* by Fricke (1999: 547), based on MHNRUN and MNHN material. *Naso lituratus* (Bloch & Schneider [ex Forster], 1801) is restricted to the Pacific Ocean (see Randall 2002: 84).

Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles. Marine species. Found in areas of coral, rock, or rubble of lagoon and seaward reefs, at depths of 0–90 m. Outside the area, Red Sea, East and South Africa east to western Indonesia, excluding the northern Indian Ocean.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Naso hexacanthus* (Bleeker, 1855) – Sleek unicornfish

Taxonomy. First record from Réunion by Randall (1984: 2 unnumbered pp); previously listed as *N. tapeinosoma* by Harmelin-Vivien (1976: 101); record confirmed by Fricke (1999: 547), based on MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Aldabra, Seychelles. Marine species. Found in clear lagoon reefs and seaward reef slopes, at depths of 6–150 m. Outside the area, Red Sea and East Africa east to Hawaiian, Marquesas and Ducie islands, north

to southern Japan and Ogasawara Islands, south to Lord Howe Island.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Very sensitive to human activities. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté nº 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Naso thynnoides* (Valenciennes in Cuvier & Valenciennes, 1835) – Oneknife unicornfish

Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 101); record confirmed by Fricke (1999: 548), based on BPBM and MNHN material.

Distribution. Réunion, Mauritius, Seychelles. Marine species. Found in steep outer lagoon and seaward coral reef slopes, at depths of 2–40 m. Outside the area, East Africa east to Caroline Islands.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Very sensitive to human activities. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté nº 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Naso tuberosus* Lacepède [ex Commerson], 1801 – Humpnose unicornfish

Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 101); previously listed as *N. tuber* by Guichenot (1863: C27).

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles, Cargados Carajos. Marine species. Found in coral reefs, at depths of 2–40 m. Outside the area, East Africa.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Very sensitive to human activities. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté nº 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Naso unicolor* (Günther [ex Liénard], 1861) – Slender unicornfish; Licorne (Réunion)

Taxonomy. First record from Réunion by Biais & Taquet (1992: 75) as *Naso minor*; previously listed as *Axinurus dipeltis* and *A. leptopeltis* [nomina nuda] by Guichenot (1863: C27). *Naso minor* was placed in the synonymy of *N. unicolor* by Fricke (1999: 549); Randall (2001: 171) disagreed and treated *N. unicolor* as indeterminable.

Distribution. Réunion, Mauritius. Marine species. Found on coastal to outer coral reef slopes, at depths of 8–50 m. Outside the area, East Africa east to Philippines.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Very sensitive to human activities. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté nº 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Naso unicornis* (Forsskål in Niebuhr, 1775) – Bluespine unicornfish; Licorne (Réunion)

Taxonomy. First record from Réunion by Playfair & Günther (1867: IX) as *Naseus unicornis*; previously listed as *Naseus fronticornis* by Guichenot (1863: C27); record confirmed by Fricke (1999: 549–550), based on LEMUR, MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Marine species. Found in channels, moats, lagoon and seaward coral and rocky reefs with strong surge, at depths of 1–180 m. Outside the area, Red Sea, East and South Africa east to Hawaiian, Marquesas and Tuamotu islands, north to southern Japan and Ogasawara Islands, south to Lord Howe Island and Rapa.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté nº 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Naso vlamingi* (Valenciennes in Cuvier & Valenciennes, 1835) – Bignose unicornfish; Nason zébré

Taxonomy. First record from Réunion by Letourneur et al. (2004: 205).

Distribution. Réunion, Madagascar, Seychelles. Marine species. Found in mid-water aggregations along seaward coral reefs, at depths of 1–50 m. Outside the area, East Africa east to Line, Marquesas and Tuamotu islands, north to southern Japan, south to southern Great Barrier Reef/Australia and New Caledonia.

Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Rare. Very sensitive to human activities. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté nº 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Paracanthurus hepatus* (Linné, 1766) – Palette surgeonfish

Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 101); record confirmed by Fricke (1999: 550–551), based on MNHN material.

Distribution. Réunion, Mauritius, Madagascar, Aldabra, Seychelles. Marine species. Found in clear, current-swept terraces of seaward reefs; observed in loose aggregations 1–2 m above the bottom; juveniles and subadults typically in groups near isolated *Pocillopora* coral heads; at depths of 2–40 m. Outside the area, East and South Africa east to Marshall and Line islands, north to southern Japan and Ogasawara Islands, south to southern Great Barrier Reef/Australia, New Caledonia and Samoa.

Conservation. Endangered in Réunion (EN). Threats: FIB, HAB, EUT. Rare. Very sensitive to human activities. Significant decline. High priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté nº 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Zebrasoma gemmatum* (Valenciennes in Cuvier & Valenciennes, 1835) – Gem surgeonfish

Taxonomy. First record from Réunion by Letourneur (1992: 53).

Distribution. Réunion, Mauritius, Rodrigues, Madagascar. Marine species. Found in coral and rocky reefs, juveniles in reef lagoons; at depths of 1–61 m. Outside the area, East and South Africa.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté nº 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Zebrasoma scopas* (Cuvier, 1829) – Brushtail tang

Taxonomy. First record from Réunion by Letourneur (1991: 164); previously listed as *Harpurus rhombeus* (non Kittlitz,

1834) and *H. Rüppelli* by Bleeker (1874: 97), and as *Zebrasoma flavescens* (non Bennett, 1828) by Harmelin-Vivien (1976: 102); record confirmed by Fricke (1999: 551–553), based on LEMUR and SMNS material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Marine species. Found in clear, current-swept terraces of seaward reefs; observed in loose aggregations 1–2 m above the bottom; juveniles and subadults typically in groups near isolated *Pocillopora* coral heads; at depths of 2–40 m. Outside the area, East and South Africa east to Tuamotu Archipelago, north to southern Japan and Ogasawara Islands, south to Lord Howe and Rapa islands.

Conservation. Endangered in Réunion (EN). Threats: HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté nº 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Zebrasoma velifer* (Bloch, 1795) – Desjardin's sailfin tang

Taxonomy. First record from Réunion by Guichenot (1863: C27) as *Acanthurus velifer*; subsequently listed as *Zebrasoma veliferum* by Fourmanoir & Guézé (1962b: 9); record confirmed by Fricke (1999: 554–555), based on LEMUR and MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles, Cargados Carajos. Marine species. Found in lagoon and seaward reefs from the lower surge zone; solitary juveniles found among rocks or coral of shallow protected, sometimes turbid reefs; at depths of 0–30 m. Outside the area, Red Sea and East Africa east to Hawaiian and Tuamotu islands, north to southern Japan and Ogasawara Islands, south to southern Great Barrier Reef/Australia, New Caledonia and Rapa.

Conservation. Endangered in Réunion (EN). Threats: FIB, HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté nº 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

## Sphyraenidae – Barracudas

*Sphyraena acutipinnis* Day, 1876 – Sharp-fin barracuda

Taxonomy. First record from Réunion by Fricke (1999: 555); previously described as *S. obtusata* (part: non Cuvier in Cuvier & Valenciennes, 1829) by Cuvier in Cuvier & Valenciennes (1829a: 350–352).

Distribution. Réunion, Madagascar. Marine species. Found in lagoon and seaward reefs, at depths of 0–20 m. Outside the area, East and South Africa east to Hawaiian, Marquesas and Tuamotu islands, north to southern Japan.

Conservation. Endangered in Réunion (EN). Threats: FIT, HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action.

*Sphyraena barracuda* (Catesby [ex Edwards], 1771) – Great barracuda; Barracuda (Réunion)

Taxonomy. First record from Réunion by Fourmanoir & Guézé (1963: 17); previously described as *S. Dussumieri* by Valenciennes in Cuvier & Valenciennes (1831: 508–509); record confirmed by Fricke (1999: 555), based on MHNRUN material.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar. Transitional water and marine. Juveniles occur in estuaries and shallow sheltered inner reef areas; adults are found in a wide range of habitats from murky inner harbours to open seas; at depths of 1–100 m. Outside the area, in all tropical oceans except the eastern Pacific.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, FIB, HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté nº 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Sphyraena obtusata* Cuvier in Cuvier & Valenciennes, 1829 – Yellowstripe barracuda; Bécune (Réunion), bécune obtuse (France)

Taxonomy. First record from Réunion by Cuvier in Cuvier & Valenciennes (1829a: 350–352, part), supported by Douichi & Nakabo (2005: 137–143); subsequently listed as *S. obtusa* by Bleeker (1874: 79), as *S. chrysotaenia* (non Klunzinger, 1884) by Sylvia & Williams in Smith & Heemstra (1986: 723), and as *S. Commersoni* by Blanc & Postel (1958: 368–373); record confirmed by Fricke (1999: 556–557), based on MNHN material.

Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles. Transitional water and marine. Found in bays and estuaries, in seagrass beds and rocky reefs, at depths of 10–120 m. Outside the area, Red Sea, East and South Africa east to Samoa, north to southern Japan and Korea, south to Lord Howe Island.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, HAB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

## Gempylidae – Snake mackerels

*Gempylus serpens* Cuvier, 1829 – Snake mackerel

Taxonomy. First record from Réunion by Nakamura (1984a: 2 unnumbered pp.).

Distribution. Réunion, Mauritius. Marine species. Oceanic; adults migrate to the surface at night while larvae and juveniles are found near the surface during the day; at depths of 0–600 m. Outside the area, worldwide in tropical, subtropical and temperate oceans.

Conservation. Endangered in Réunion (EN). Threats: FIT, FIB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Lepidocybium flavobrunneum* (Smith, 1843) – Escolar

Taxonomy. First record from Réunion by Nakamura (1984a: 2 unnumbered pp.).

Distribution. Réunion, Mauritius, Rodrigues. Marine species. Found over the continental slope; migrates upward at night, at depths of (0–)200–885 m. Outside the area, worldwide in tropical and subtropical oceans.

Conservation. Endangered in Réunion (EN). Threats: FIT, FIB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action.

*Prometichthys prometheus* (Cuvier in Cuvier & Valenciennes, 1832) – Roudi escolar

Taxonomy. First record from Réunion by Guichenot (1863: C26) as *Gempylus prometheus*.

Distribution. Réunion, Mauritius, Comores. Marine species. Found on continental and island slopes, migrates to midwater at night, at depths of 80–800 m. Outside the area, worldwide in tropical and warm temperate oceans.

Conservation. Data deficient in Réunion (DD). Threats: FIB,

EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Rexea promethoides* (Bleeker, 1856) – Royal escolar
Taxonomy. First record from Réunion by NAKAMURA & PARIN (1993: 48–49); previously listed by FOURMANOIR & GUÉZÉ (1967: 55–56) as *R. solandri* (non Cuvier in Cuvier & Valenciennes, 1832).
Distribution. Réunion, Mauritius. Marine species. Benthopelagic, at depths of 135–540 m. Outside the area, East Africa east to Fiji and Tuvalu, north to southern Japan, south to northern Australia.
Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action.

*Ruvettus pretiosus* Cocco, 1833 – Oilfish; Rouvet (Réunion)
Taxonomy. First record from Réunion by FOURMANOIR & GUÉZÉ (1967: 56); record confirmed by FRICKE (1999: 558–559), based on MHNRUN material.
Distribution. Réunion, Mauritius, Rodrigues, Comores. Marine species. Benthopelagic or pelagic, over the continental shelf, sometimes in oceanic waters; usually solitary or in pairs near the bottom, at depths of 100–800 m. Outside the area, in all tropical, subtropical and temperate oceans.
Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Thyrsitoides marleyi* Fowler, 1929 – Black snoek; Escolier gracile (Réunion)
Taxonomy. First record from Réunion by FOURMANOIR & GUÉZÉ (1967: 55); record confirmed by FRICKE (1999: 559), based on MNHN material.
Distribution. Réunion, Mauritius, Comores. Marine species. Mesobenthopelagic, at depths of 0–400 m. Outside the area, East and South Africa east to Vanuatu, north to southern Japan, south to New South Wales/Australia.
Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

## Trichiuridae – Cutlassfishes

*Benthodesmus elongatus* (Clarke, 1879) – Elongate frostfish
Taxonomy. First record from Réunion by DURVILLE et al. (submitted).
Distribution. Réunion, Madagascar Ridge. Marine species. Benthopelagic, juveniles mesopelagic, at depths of 178–950 m. Outside the area, temperate oceans of the southern hemisphere.
Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitive to human activities. Decline unknown. Low priority for conservation action.

*Evoxymetopon poeyi* Günther, 1887 – Poey's scabbardfish
Taxonomy. First record from Réunion by NAKAMURA & PARIN (1993: 88–89).
Distribution. Réunion, Mauritius. Marine species. Benthopelagic, at depths of 0–400 m. Outside the area, southern Japan to Kyushu-Palau Ridge.
Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitive to human activities. Decline unknown. Low priority for conservation action.

*Trichiurus lepturus* Linnaeus, 1758 – Cutlassfish; Poisson sabre commun (France)
Taxonomy. First record from Réunion by FOURMANOIR & GUÉZÉ (1963: 8–9); previously listed as *T. savala* (non Cuvier, 1829) by GUICHENOT (1863: C26); record confirmed by FRICKE (1999: 559–560), based on MHNRUN material.
Distribution. Réunion, Mauritius. Marine species. Benthopelagic, at depths of 0–350 m. Outside the area, worldwide in tropical and temperate waters.
Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitive to human activities. Decline unknown. Low priority for conservation action.

## Scombridae – Mackerels and tunas

*Acanthocybium solandri* (Cuvier in Cuvier & Valenciennes, 1831) – Wahoo; Thon banane (Réunion), thazard-batard (France)
Taxonomy. First record from Réunion by FOURMANOIR & GUÉZÉ (1963: 6).
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar. Marine species. Pelagic, at depths of 0–12 m. Outside the area, worldwide in tropical and temperate oceans.
Conservation. Critically endangered in Réunion (CR). Threats: FIT, PRL, EUT. Very sensitive to human activities. Keystone species. Severe decline. High priority for conservation action. Proposed for Annex V of the EU Habitats Directive.

*Allothunnus fallai* Serventy, 1948 – Slender tuna; Thon élégant (France)
Taxonomy. First record from Réunion by COLLETTE (1984: 2 unnumbered pp.).
Distribution. Réunion, Mauritius, Rodrigues. Marine species. Pelagic, at depths of 0–20 m. Outside the area, worldwide in oceans between 20°S and 50°S.
Conservation. Critically endangered in Réunion (CR). Threats: FIT, PRL, EUT. Very sensitive to human activities. Keystone species. Severe decline. High priority for conservation action.

*Auxis rochei* (Risso, 1810) – Bullet tuna
Taxonomy. First record from Réunion by COLLETTE & NAUEN (1983: 29–30); recorded by FRICKE (1999: 563) as *A. rochei rochei*.
Distribution. Réunion, Mauritius. Marine species. Pelagic, at depths of 1–20 m. Outside the area, in tropical and warm temperate waters of the Atlantic, Indian and West Pacific oceans.
Conservation. Critically endangered in Réunion (CR). Threats: FIT, PRL, EUT. Very sensitive to human activities. Keystone species. Severe decline. High priority for conservation action. Proposed for Annex V of the EU Habitats Directive.

*Auxis thazard* (Lacepède, 1800) – Frigate tuna; Thazard
Taxonomy. First record from Réunion by COLLETTE & NAUEN (1983: 30–31); recorded by FRICKE (1999: 563) as *A. thazard thazard*.
Distribution. Réunion, Mauritius, Madagascar. Marine species. Pelagic, at depths of 20–50 m. Outside the area, in tropical and warm temperate waters of the Atlantic, Indian and West Pacific oceans.
Conservation. Endangered in Réunion (EN). Threats: FIT, PRL, EUT. Very sensitive to human activities. Keystone species. Severe decline. High priority for conservation action.

*Euthynnus affinis* (Cantor, 1850) – Eastern little tuna; Bonite la côte (Réunion), thonine orientale (France)

Taxonomy. First record from Réunion by Biais & Taquet (1992: 16, 74); previously listed as *Thynnus thunnina* (non Cuvier, 1829) by Guichenot (1863: C26) as *Euthynnus yaito* by Blanc & Postel (1958: 369), and as *E. alletteratus* (non Rafinesque-Schmaltz, 1810) by Fourmanoir & Guézé (1963: 4); record confirmed by Fricke (1999: 563), based on MHNRUN material.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles. Marine species. Pelagic, at depths of 0–200 m. Outside the area, East and South Africa east to Panama, north to Ogasawara Islands, south to northern Australia.

Conservation. Endangered in Réunion (EN). Threats: FIT, PRL, EUT. Very sensitive to human activities. Keystone species. Severe decline. High priority for conservation action. Proposed for Annex V of the EU Habitats Directive.

*Gymnosarda unicolor* (Rüppell, 1836) – Dogtooth tuna; Thon dents à chien (Réunion), bonite à gros yeux (France)

Taxonomy. First record from Réunion by Blanc & Postel (1958: 369, 370, 373); subsequently listed as *G. nuda* by Fourmanoir & Guézé (1963: 4).

Distribution. Réunion, Mauritius, Rodrigues, Comores. Marine species. An offshore species mainly found around coral reefs, at depths of 10–100 m. Outside the area, Red Sea, East and South Africa east to French Polynesia, north to southern Japan and Ogasawara Islands, south to New Caledonia and Rapa.

Conservation. Endangered in Réunion (EN). Threats: FIT, FIB, PRL, EUT. Very sensitive to human activities. Keystone species. Severe decline. High priority for conservation action.

*Katsuwonus pelamis* (Linnaeus, 1758) – Skipjack tuna; Bonite kalou (Réunion)

Taxonomy. First record from Réunion by Fourmanoir & Guézé (1963: 4).

Distribution. Réunion, Mauritius, Rodrigues. Marine species. Pelagic offshore, at depths of 0–260 m. Outside the area, worldwide in tropical and subtropical oceans.

Conservation. Endangered in Réunion (EN). Threats: FIT, PRL, EUT. Very sensitive to human activities. Keystone species. Severe decline. High priority for conservation action.

*Rastrelliger kanagurta* (Cuvier [ex Russell], 1816) – Indian mackerel; Macquereau des Indes

Taxonomy. First record from Réunion by Fricke (1999: 564–565), based on MHNRUN material.

Distribution. Réunion, Mauritius, Madagascar. Marine species. Found in coastal bays, harbours and deep lagoons, usually in some turbid plankton-rich waters, at depths of 20–90 m. Outside the area, Red Sea, East and South Africa east to Samoa, north to Ryukyu Islands, south to northwestern Australia.

Conservation. Endangered in Réunion (EN). Threats: FIT, PRL, EUT. Very sensitive to human activities. Keystone species. Severe decline. High priority for conservation action.

*Sarda orientalis* (Temminck & Schlegel, 1844) – Striped bonito; Bonite (Réunion), bonite oriental (France)

Taxonomy. First record from Réunion by Fricke (1999: 565); previously listed as *Pelamys sarda* (non Bloch, 1793) by Guichenot (1863: C26).

Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Coastal pelagic, at depths of 1–167 m. Outside the area, Red Sea, East and South Africa east to Panama, north to southern Japan and Ogasawara Islands.

Conservation. Endangered in Réunion (EN). Threats: FIT, PRL, EUT. Very sensitive to human activities. Keystone species. Severe decline. High priority for conservation action. Proposed for Annex V of the EU Habitats Directive.

*Scomberomorus commerson* (Lacepède [ex Commerson], 1800) – King mackerel; Thon blanc (Réunion), thazard rayé (France)

Taxonomy. First record from Réunion by Guichenot (1863: C26) as *Cybium Commersonii*; record confirmed by Fricke (1999: 565–566), based on MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles. Marine species. Pelagic, from shallow water to edge of continental shelf, at depths of 10–70 m. Outside the area, Red Sea, East and South Africa east to Palau/Belau and Fiji, north to Korea and southern Japan, south to New South Wales/Australia, New Caledonia and Lord Howe Island, recently immigrated into eastern Mediterranean through Suez Canal.

Conservation. Endangered in Réunion (EN). Threats: FIT, PRL, EUT. Very sensitive to human activities. Keystone species. Severe decline. High priority for conservation action. Proposed for Annex V of the EU Habitats Directive.

*Thunnus alalunga* (Bonnaterre, 1788) – Albacore; Thon batard (Réunion)

Taxonomy. First record from Réunion by Fourmanoir & Guézé (1963: 6) as *Germo alalungà*; previously listed by Guichenot (1863: C26) as *Thynnus vulgaris* (non Cuvier in Cuvier & Valenciennes, 1832), and by Playfair & Günther (1867: X) as *Thynnus thynnus* (non Linnaeus, 1758).

Distribution. Réunion, Mauritius, Rodrigues. Marine species. Oceanic, pelagic, at depths of 0–600 m. Outside the area, worldwide in tropical and subtropical waters.

Conservation. Critically endangered in Réunion (CR). Threats: FIT, PRL, EUT. Very sensitive to human activities. Keystone species. Severe decline. High priority for conservation action. Proposed for Annex V of the EU Habitats Directive.

*Thunnus albacares* (Bonnaterre, 1788) – Yellowfin tuna; Thon jaune (Réunion)

Taxonomy. First record from Réunion by Collette (1984: 2 unnumbered pp.); previously listed by Fourmanoir & Guézé (1963: 6) as *Neothunnus macropterus*; record confirmed by Fricke (1999: 566), based on MHNRUN material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Marine species. Oceanic, pelagic, at depths of 0–250 m. Outside the area, worldwide in tropical and subtropical waters.

Conservation. Critically endangered in Réunion (CR). Threats: FIT, PRL, EUT. Very sensitive to human activities. Keystone species. Severe decline. High priority for conservation action. Proposed for Annex V of the EU Habitats Directive.

*Thunnus obesus* (Lowe, 1839) – Bigeye tuna; Thon gros yeux (Réunion)

Taxonomy. First record from Réunion by Collette (1984: 2 unnumbered pp.); record confirmed by Fricke (1999: 566–567), based on MHNRUN material.

Distribution. Réunion, Mauritius, Rodrigues. Marine species. Oceanic, pelagic, at depths of 0–250 m. Outside the area, worldwide in tropical and subtropical water.

Conservation. Critically endangered in Réunion (CR). Threats: FIT, PRL, EUT. Very sensitive to human activities. Key-

stone species. Severe decline. High priority for conservation action. Proposed for Annex V of the EU Habitats Directive.

### Xiphiidae – Swordfishes

*Xiphias gladius* Linnaeus, 1758 – Swordfish; Espadon (Réunion)
Taxonomy. First record from Réunion by Nakamura (1984c: 2 unnumbered pp.) and Biais & Taquet (1992: 16, 74).
Distribution. Réunion, Mauritius, Rodrigues. Marine species. Pelagic, at depths of 0–800 m. Outside the area, worldwide in tropical and temperate waters.
Conservation. Threatened migrant in Réunion (TM). Threats: FIT, PRL, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action. Highly migratory species, listed on Annex I of the 1982 Convention on the Law of the Sea (Anonymus 1994).

### Istiophoridae – Sailfishes

*Istiompax indicus* (Cuvier in Cuvier & Valenciennes, 1832) – Black marlin; Makaire noir
Taxonomy. First record from Réunion by Fourmanoir & Guézé (1963: 4) as *Istiompax indicus*. Taxonomic decision of Collette et al. (2006: 465).
Distribution. Réunion, Mauritius, Rodrigues, Madagascar. Marine species. Pelagic, at depths of 0–915 m. Outside the area, worldwide in tropical and subtropical waters.
Conservation. Threatened migrant in Réunion (TM). Threats: FIT, PRL, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action. Highly migratory species, listed on Annex I of the 1982 Convention on the Law of the Sea (Anonymus 1994).

*Istiophorus platypterus* (Shaw & Nodder [ex Shaw], 1792) – Sailfish; Voilier (Réunion)
Taxonomy. First record from Réunion by Nakamura (1984b: 2 unnumbered pp.) and Biais & Taquet (1992: 16, 74, *Xiphias platypterus*); record confirmed by Fricke (1999: 560), based on MHNRUN material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Seychelles. Marine species. Pelagic, at depths of 0–200 m. Outside the area, worldwide in tropical and subtropical waters.
Conservation. Threatened migrant in Réunion (TM). Threats: FIT, PRL, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action. Highly migratory species, listed on Annex I of the 1982 Convention on the Law of the Sea (Anonymus 1994).

*Kajikia audax* (Philippi, 1887) – Striped marlin; Marlin rayé (Réunion)
Taxonomy. First record from Réunion by Fourmanoir & Guézé (1963: 1, pl. 1, fig. 2) as *Makaira audax*. Taxonomic decision of Collette et al. (2006: 465).
Distribution. Réunion, Mauritius, Rodrigues. Marine species. Pelagic, at depths of 0–1830 m. Outside the area, Red Sea and East Africa east to Panama.
Conservation. Threatened migrant in Réunion (TM). Threats: FIT, PRL, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action. Highly migratory species, listed on Annex I of the 1982 Convention on the Law of the Sea (Anonymus 1994).

*Makaira nigricans* Lacepède, 1802 – Blue marlin; Marlin bleu (Réunion), makaire bleu (France)
Taxonomy. First record from Réunion by Nakamura (1984b: 2 unnumbered pp.); previously listed as *M. nigricans* (non Lacepède, 1802) by Fourmanoir & Guézé (1963: 1, pl. 1, fig. 2); record confirmed as *Makaira mazara* by Fricke (1999: 561), based on MHNRUN material. Taxonomic decision of Collette et al. (2006: 465).
Distribution. Réunion, Mauritius, Rodrigues. Marine species. Pelagic, at depths of 0–200 m. Outside the area, tropical, subtropical and temperate waters of the Indo-Pacific.
Conservation. Threatened migrant in Réunion (TM). Threats: FIT, PRL, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action. Highly migratory species, listed on Annex I of the 1982 Convention on the Law of the Sea (Anonymus 1994).

*Tetrapturus angustirostris* Tanaka, 1914 – Shortbill spearfish; Marlin rostre court (Réunion)
Taxonomy. First record from Réunion by Nakamura (1984b: 2 unnumbered pp.) and Biais & Taquet (1992: 74).
Distribution. Réunion, Mauritius, Rodrigues. Marine species. Pelagic, at depths of 0–1830 m. Outside the area, antiequatorial in tropical and subtropical waters of the Indo-Pacific, straying into the southeastern Atlantic.
Conservation. Threatened migrant in Réunion (TM). Threats: FIT, PRL, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action. Highly migratory species, listed on Annex I of the 1982 Convention on the Law of the Sea (Anonymus 1994).

### Nomeidae – Driftfishes

*Cubiceps capensis* (Smith, 1845) – Cape fathead
Taxonomy. **New record** from Réunion, based on a specimen collected by local fishermen, off Saint-Paul, at 350 m depth, in 2006 (P. Durville, E. Tessier, T. Mulochau).
Distribution. Réunion. Marine species. Pelagic, at depths of 0–350 m. Outside the area, worldwide in tropical and temperate oceans.
Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Rare. Sensitive to human activities. Decline unknown. Low priority for conservation action.

*Cubiceps whiteleggii* (Waite, 1894) – Indian driftfish; Dérivant indien
Taxonomy. **New record** from Réunion; previously listed by Haedrich & Nzioka (1984: 2 unnumbered pp.) as *Psenes squamiceps*, by Fricke (1999: 562) as *P. squamiceps*, and by Letourneur et al. (2004: 205) as *Cubiceps* sp., based on MNHN material.
Distribution. Réunion, Mauritius, Rodrigues. Marine species. Found on deep water on the continental slope, at depths of 250–800 m. Outside the area, East and South Africa east to Japan, south to eastern Australia.
Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitive to human activities. Decline unknown. Low priority for conservation action.

### Osphronemidae – Gouramis

*Osphronemus goramy* Lacepède [ex Commerson], 1801 – Gourami; Gouramier (Réunion)

Taxonomy. First record from Réunion by Lacepède (1801: 117–121), locality erroneously given as Isle de France/Mauritius; previously described by Commerson (1767–1771a: "Faun. Borb. 127, Le poisson Gourami") from Saint-Denis; subsequently described as *Osphronemus olfax* by Cuvier in Cuvier & Valenciennes (1831: 377–387), locality again erroneously given as Isle de France/Mauritius; record confirmed by Fricke (1999: 568–569), based on MHNRUN material.

Distribution. Réunion (introduced in the mid 17th century), Mauritius (introduced). Freshwater species. Found naturally in swamps, lakes and rivers with vegetation, introduced for aquaculture purposes. Outside the area, originally limited to Sumatera, Borneo and Java, the Malay Peninsula, Thailand and Indochina.

Conservation. Not evaluated in Réunion (NE). Not native of Réunion. No conservation action in favour of this species advisable.

*Trichogaster trichopterus* (Pallas, 1770) – Threespot gourami

Taxonomy. First record from Réunion by Valade (2008: 3).

Distribution. Réunion (introduced). Freshwater species. Found in marshes, swamps and canals. Outside the area, originally Southeast Asia. Introduced into tropical freshwater habitats.

Conservation. Not evaluated in Réunion (NE). Not native of Réunion. No conservation action in favour of this species advisable.

### Caproidae – Boarfishes

*Antigonia capros* Lowe, 1843 – Deepbody boarfish

Taxonomy. First record from Réunion by Letourneur et al. (2004: 204). Also MHNRUN material (Durville et al. submitted).

Distribution. Réunion. Marine species. Adults are found close to bottom while juveniles occur in mid water; at depths of 50–900 m. Outside the area, worldwide in tropical and subtropical oceans.

Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitivity to human activities unknown. Decline unknown. Low priority for conservation action.

*Antigonia rubescens* (Günther, 1860) – Indo-Pacific boarfish

Taxonomy. First record from Réunion by Durville et al. (submitted), based on MHNRUN material.

Distribution. Réunion. Marine species. Benthopelagic, at depths of 50–750 m. Outside the area, India east to Philippines, north to Japan, south to Western Australia and New Caledonia.

Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitivity to human activities unknown. Decline unknown. Low priority for conservation action.

### Pleuronectidae – Flounders

*Poecilopsetta natalensis* Norman, 1931 – African righteye flounder

Taxonomy. First record from Réunion by Fricke (1999: 572), based on MNHN material.

Distribution. Réunion, Madagascar. Marine species. Found on soft bottoms, at depths of 250–450 m. Outside the area, East and South Africa east to Maldives, questionably Taiwan.

Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitive to human activities. Decline unknown. Low priority for conservation action.

### Samaridae – Crested flounders

*Samaris costae* Quéro, Hensley & Maugé, 1989 – Costa's crested flounder

Taxonomy. Original description from Réunion by Quéro et al. (1989: 105–107); record confirmed by Fricke (1999: 572), based on MNHN material.

Distribution. Réunion. Marine species. Found on soft bottoms, at depths of 90–227 m. Known only from Réunion.

Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Global importance. Sensitive to human activities. Decline unknown. Medium priority for conservation action.

### Bothidae – Lefteyed flounders

*Bothus mancus* (Broussonet, 1782) – Peacock flounder; Sole (Réunion)

Taxonomy. First record from Réunion by Letourneur (1992: 99); previously listed as *Rhombus Bourboniensis* (nomen nudum) and *R. lunatus* (non Linnaeus, 1758) by Guichenot (1863: C29); record confirmed by Fricke (1999: 570–571), based on MHNRUN, MNHN and SMNS material. Desoutter et al. (2001: 346) consider *Rhombus Bourboniensis* as unidentifiable, and not identical with *Bothus mancus*.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles, Cargados Carajos. Marine species. Found on sand bottoms near coral reefs, at depths of 1–100 m. Outside the area, Red Sea, East and South Africa east to Mexico, north to Ryukyu, Ogasawara and Hawaiian islands, south to Lord Howe, Rapa and Ducie islands.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

*Bothus pantherinus* (Rüppell, 1830) – Leopard flounder; Sole (Réunion)

Taxonomy. First record from Réunion by Fourmanoir & Guézé (1962b: 1); subsequently listed as *B. mancus* (non Broussonet, 1782) by Chabanet (1994: 242); record confirmed by Fricke (1999: 571), based on LEMUR, SMNS and USNM material.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Aldabra, Seychelles. Marine species. Found on sand bottoms near coral reefs, at depths of 1–100 m. Outside the area, Red Sea, East and South Africa east to Hawaiian, Marquesas and Society islands, north to southern Japan and Ogasawara Islands, south to Lord Howe Island.

Conservation. Vulnerable in Réunion (VU). Threats: FIT, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action.

### Soleidae – Soles

*Aseraggodes diringeri* (Quéro, 1997) – Diringer's sole

Taxonomy. Original description from Réunion as *Pardachirus diringeri* by Quéro (1997: 320–323); record confirmed by Fricke (1999: 572), based on MNHN material.

Distribution. Réunion, Mauritius. Marine species. Found on

sand bottoms in coral reef environments, at depths of 0–35 m. Outside the area, East and South Africa east to Chagos Archipelago.
Conservation. Data deficient in Réunion (DD). Threats: FIT, HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Aseraggodes guttulatus* Kaup, 1858
Taxonomy. First record from Réunion by Chabanaud (1931: 301).
Distribution. Réunion. Marine species. Found on sand bottoms. Outside the area, Maldives east to South China Sea.
Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Pardachirus pavoninus* (Lacepède [ex Commerson], 1802) – Peacock sole
Taxonomy. First record from Réunion by Guichenot (1863: C29) as *Achirus marmoratus*; record confirmed by Fricke (1999: 573–574), based on MHNRUN and MNHN material.
Distribution. Réunion, Mauritius, Madagascar. Marine species. Found on sand and mud bottoms of lagoon and seaward reefs, at depths of 1–40 m. Outside the area, East Africa east to Tonga, north to southern Japan, south to Onslow/Western Australia and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Soleichthys tubifera* (Peters, 1877) – Mascarene tubesole
Taxonomy. First record from Réunion by Fricke (1999: 574–575), based on MHNG material; previously described as *Solea borbonica* by Regan (1905: 393, pl. 6, fig. 2).
Distribution. Réunion, Mauritius. Marine species. Demersal on soft bottoms. Endemic to western Mascarenes.
Conservation. Near threatened in Réunion (NT). Threats: FIT, EUT. Local importance. Rare. Sensitive to human activities. Probable decline. High priority for conservation action.

## Cynoglossidae – Tongue soles

*Cynoglossus lachneri* Menon, 1977 – Lachner's tonguesole
Taxonomy. First record from Réunion by Quéro (1997: 327); record confirmed by Fricke (1999: 575), based on MNHN material.
Distribution. Réunion, Madagascar. Marine species. Demersal on shallow sand or mud bottoms, at depths of 1–15 m. Outside the area, East and South Africa.
Conservation. Data deficient in Réunion (DD). Threats: FIT, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Symphurus ocellatus* Bonde, 1922 – Doublespot tonguesole
Taxonomy. First record from Réunion by Quéro & Maugé (1989: 393); record confirmed by Fricke (1999: 576), based on MNHN material.
Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles. Marine species. Bathydemersal on soft bottoms, at depths of 430–640 m. Outside the area, Red Sea, Gulf of Oman, East and South Africa.
Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitive to human activities. Decline unknown. Medium priority for conservation action.

## Balistidae – Triggerfishes

*Abalistes stellatus* (Lacepède [ex Commerson] in Anonymus, 1798) – Starry triggerfish; Bourse mulet (Réunion)
Taxonomy. First record from Réunion by Biais & Taquet (1992: 75); record confirmed by Fricke (1999: 576–577), based on MHNRUN material.
Distribution. Réunion, Mauritius, Comores, Madagascar, Aldabra, Seychelles. Transitional water and marine. Found on mud and silt sand bottoms; adults on deep coral reef slopes and usually seen swimming high above the bottom, sometimes found in estuaries; juveniles in sheltered coastal bays and estuaries with outcrops of rubble or debris on open substrates; at depths of 1–350 m. Outside the area, Red Sea, East and South Africa east to Palau/Belau, Fiji and Tonga, north to southern Japan, south to New South Wales/Australia; also eastern tropical Atlantic.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Balistapus undulatus* (Park, 1797) – Orange-striped triggerfish
Taxonomy. First record from Réunion by Letourneur (1991: 164); record confirmed by Fricke (1999: 577), based on MHNRUN material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Agalega Islands. Marine species. Found in coral-rich areas of seaward reefs, at depths of 1–50 m. Outside the area, Red Sea, East and South Africa east to Line, Marquesas and Tuamotu islands, north to southern Japan and Ogasawara Islands, south to New Caledonia.
Conservation. Endangered in Réunion (EN). Threats: HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Balistoides conspicillum* (Bloch & Schneider, 1801) – Clown triggerfish; Bourse piastre, bourse pièce (Réunion), baliste léopard, baliste clown (France)
Taxonomy. First record from Réunion by Guichenot (1863: C31) as *Balistes conspicillum*; subsequently listed as *Balistoides conspiculum* by Biais & Taquet (1992: 75); record confirmed by Fricke (1999: 578), based on MHNRUN and MNHN material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Aldabra, Agalega Islands, Seychelles. Marine species. Found in clear seaward coral and rocky reefs adjacent to steep drop-offs, at depths of 1–75 m. Outside the area, East and South Africa east to Samoa, north to southern Hokkaido/Japan and Ogasawara Islands, south to Lord Howe Island.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Balistoides viridescens* (Bloch & Schneider, 1801) – Titan triggerfish; Bourse jaune (Réunion), baliste verdâtre (France)
Taxonomy. First record from Réunion by Biais & Taquet (1992:

45); record confirmed by Fricke (1999: 578–579), based on MHNRUN, MNHN and SMNS material.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Aldabra, Seychelles. Marine species. Found in lagoon and seaward reefs and sheltered inner coral and rocky reef slopes; juveniles often associated with isolated patches of branching coral or rubble of shallow sandy protected areas, including tidal pools; adults occur singly or in pairs on the slopes of deep lagoon or seaward reefs; at depths of 0–50 m. Outside the area, Red Sea and East Africa east to Wake Atoll and Pitcairn Group, north to southern Japan and Ogasawara Islands, south to New South Wales/Australia and Tonga.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Canthidermis maculata* (Bloch, 1786) – Rough triggerfish; Bourse (Réunion)

Taxonomy. First record from Réunion by Bleeker (1874: 10) as *Balistes (Canthidermis) maculatus*; previously listed by Guichenot (1863: C31) as *B. angulosus*; record confirmed by Fricke (1999: 579), based on MHNRUN material.

Distribution. Réunion, Madagascar. Marine species. Epipelagic in shallow coastal and offshore waters, at depths of 1–110 m. Outside the area, worldwide in tropical and temperate oceans.

Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Melichthys indicus* Randall & Klausewitz, 1973 – Indian Ocean triggerfish

Taxonomy. First record from Réunion by Fricke (1999: 579); previously listed as *Balistes (Balistapus) niger* (non Bloch, 1786) by Bleeker (1874: 71, in part).

Distribution. Réunion, Mauritius, Aldabra, Seychelles. Marine species. Found on coral-rich seaward coral reef slopes, at depths of 2–30 m. Outside the area, Red Sea, East and South Africa east to Sumatera/Indonesia.

Conservation. Critically endangered in Réunion (CR). Threats: HAB, EUT. Rare. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Melichthys niger* (Bloch, 1786) – Black triggerfish; Balistes noir

Taxonomy. First record from Réunion by Guichenot (1863: C31) as *Balistes niger*.

Distribution. Réunion, Mauritius, Comores, Madagascar, Aldabra. Marine species. Found in clear seaward coral reefs, on inner and outer reef crests, usually near the slope or drop-off to deeper water; at depths of 0–75 m. Outside the area, worldwide in tropical and subtropical oceans.

Conservation. Endangered in Réunion (EN). Threats: HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Melichthys vidua* (Richardson [ex Solander], 1845) – Pinktail triggerfish

Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 102).

Distribution. Réunion. Marine species. Found in seaward coral reefs with rich invertebrate growth, at depths of 4–60 m. Outside the area, East and South Africa east to Hawaiian, Line, Marquesas and Gambier islands, north to southern Japan and Ogasawara Islands, south to Great Barrier Reef/Australia, New Caledonia and Tonga.

Conservation. Endangered in Réunion (EN). Threats: HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Odonus niger* (Rüppell, 1836) – Redtooth triggerfish; Bourse noire (Réunion)

Taxonomy. First record from Réunion by Hutchins (1984: 2 unnumbered pp.); previously described by Commerson (1767–1771b: "Faun. Borb. No. 13, Le Bourse noire de l'île de Bourbon"); record confirmed by Fricke (1999: 580–581), based on MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Found in current-swept seaward coral and rocky reefs, at depths of 5–40 m. Outside the area, Red Sea, East and South Africa east to Marquesas and Society islands, north to southern Japan and Ogasawara Islands, south to southern Great Barrier Reef/Australia, and Tonga.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Pseudobalistes flavimarginatus* (Rüppell, 1829) – Yellowface triggerfish

Taxonomy. First record from Réunion by Letourneur (1992: 40, 83).

Distribution. Réunion, Mauritius, Comores, Madagascar. Transitional water and marine. Found in coastal to inner coral and rocky reefs and estuaries, often in silty habitats, at depths of 2–50 m. Outside the area, Red Sea, East and South Africa east to Marshall and Tuamotu islands, north to southern Japan and Ogasawara Islands, south to Great Barrier Reef/Australia and New Caledonia.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Pseudobalistes fuscus* (Lacepède [ex Commerson] in Bloch & Schneider, 1801) – Blue triggerfish, rippled triggerfish; Bourse (Réunion)

Taxonomy. First record from Réunion by Letourneur (1992: 40); previously described as *Balistes reticulatus* by Hollard (1854: 312); record confirmed by Fricke (1999: 582–583), based on MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar, Seychelles, Cargados Carajos. Marine species. Found in clear shallow lagoons and seaward coral and rocky reefs; sandy areas near reef patches of reef edge are preferred; at depths of 5–50 m. Outside the area, Red Sea, East and South Africa

east to Marshall and Tuamotu islands, north to southern Japan and Ogasawara Islands, south to southern Great Barrier Reef/Australia.

Conservation. Vulnerable in Réunion (VU). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Significant decline. High priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Rhinecanthus aculeatus* (Linnaeus, 1758) – Picassofish; Bourse revolver (Réunion)

Taxonomy. First record from Réunion by Guichenot (1863: C31) as *Balistes aculeatus*; record confirmed by Fricke (1999: 583–584), based on MNHN and SMNS material. Also MHNRUN material (Durville et al. submitted).

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles. Marine species. Found in subtidal reef flats and shallow protected coral reef lagoons, at depths of 0–50 m. Outside the area, Red Sea, East Africa east to Pitcairn Group, north to southern Japan and Ogasawara Islands, south to Lord Howe Island.

Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Rhinecanthus cinereus* (Bonnaterre [ex Commerson], 1788) – Mask picassofish; Bourse (Réunion)

Taxonomy. First record from Réunion by Guichenot (1863: C31) as *Balistes cinereus* and *B. arcuatus*; record confirmed by Fricke (1999: 584), based on MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Comores, Madagascar. Marine species. Found in lagoon and rocky reef habitats, at depths of 1–50 m. Outside the area, Maldives.

Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Rhinecanthus rectangulus* (Lacepède [ex Commerson] in Bloch & Schneider, 1801) – Wedge picassofish; Bourse (Réunion), picasso noir (France)

Taxonomy. First record from Réunion by Blanc & Postel (1958: 369); previously listed as *Balistes assasi* (non Forsskål in Niebuhr, 1775) by Guichenot (1863: C31); record confirmed by Fricke (1999: 585), based on MNHN and SMNS material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Marine species. Found in algal reefs and shallow outer coral reefs subject to surge, at depths of 0–20 m. Outside the area, Red Sea and East Africa east to Pitcairn Group, north to Izu and Ogasawara islands, south to Lord Howe and Kermadec islands.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Sufflamen bursa* (Lacepède [ex Commerson] in Bloch & Schneider, 1801) – Boomerang triggerfish

Taxonomy. First record from Réunion by Bleeker (1874: 71) as *Balistes (Balistapus) bursa*; record confirmed by Fricke (1999: 586), based on MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Seychelles. Marine species. Found in clear inner and outer coral and rocky reef habitats from exposed algae reef flats to deep along drop-offs, at depths of 3–90 m. Outside the area, East and South Africa east to Wake Atoll and Pitcairn Group, north to southern Japan and Ogasawara Islands, south to southern Great Barrier Reef/Australia, New Caledonia and Rapa.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Sufflamen chrysopterum* (Bloch & Schneider, 1801) – Halfmoon triggerfish; Baliste double-queue

Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 102) as *Hemibalistes chrysoptera*; record confirmed by Fricke (1999: 586–587) as *Sufflamen chrysopterus*, based on MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Europa Island, Comores, Madagascar, Seychelles. Marine species. Found in coastal to outer coral and rocky reefs, from silty lagoons to pristine outer reef walls, at depths of 1–30 m. Outside the area, East and South Africa east to Samoa, north to southern Japan and Ogasawara Islands, south to Lord Howe Island.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Sufflamen fraenatum* (Latreille, 1804) – Masked triggerfish; Bourse (Réunion), baliste masqué (France)

Taxonomy. First record from Réunion by Guichenot (1863: C31) as *Balistes frenatus*; record confirmed by Fricke (1999: 586–587) as *Sufflamen fraenatus*, based on MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Rodrigues. Marine species. Found on coastal coral and rocky reefs, often in silty habitats and in lagoons on open sand, at depths of 8–186 m. Outside the area, Red Sea, East and South Africa east to Hawaiian Islands and Pitcairn Group, north to southern Japan and Ogasawara Islands, south to Lord Howe Island.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Xanthichthys auromarginatus* (Bennett, 1832) – Gilded triggerfish

Taxonomy. First record from Réunion by Randall et al. (1978: 696–698); previously described as *Balistes gutturosus* by Hollard (1854: 63–65), and as *B. calolepis* by Hollard (1854: 67–69); record confirmed by Fricke (1999: 588), based on MNHN material.

Distribution. Réunion, Mauritius. Marine species. Found in current-swept seaward drop-offs and ledges with rich invertebrate growth, at depths of 8–150 m. Outside the area, Chagos Archipelago east to Hawaiian Islands, north to Ryukyu Islands, south to southern Australia and New Caledonia.

Conservation. Endangered in Réunion (EN). Threats: HAB, EUT. Very sensitive to human activities. Keystone species. Significant decline. High priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Xanthichthys lineopunctatus* (Hollard, 1854) – Lined triggerfish; Bourse (Réunion)

Taxonomy. Originally described from Réunion as *Balistes lineopunctatus* by Hollard (1854: 65–67), and listed as *B. (Parabalistes) ringens* (non Linnaeus, 1758) by Bleeker (1874: 70); recorded as *Xanthichthys lima* by Fricke (1999: 589), based on MHNRUN and MNHN material. *Balistes lima* Bennett, 1832 is an unused senior synonym. Observed at Saint-Paul, at 150 m depth, in 2006 (T. Mulochau, P. Durville).

Distribution. Réunion, Mauritius, Comores. Marine species. Found on coastal reefs and rocky coasts, at depths of 5–150 m. Outside the area, antiequatorial, southeastern Africa.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Keystone species. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

## Monacanthidae – Leatherjackets

*Aluteres monoceros* (Linnaeus, 1758) – Unicorn leatherjacket; Bourse loulou

Taxonomy. First record from Réunion by Letourneur et al. (2004: 205).

Distribution. Réunion, Seychelles. Marine species. Occasionally in shallow water by steep drop-offs in coral and rocky reefs; solitary or in pairs; juveniles are pelagic, seen under floating objects; at depths of 1–50 m. Outside the area, circumtropical.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Aluteres scriptus* (Osbeck, 1765) – Scrawled leatherjacket

Taxonomy. First record from Réunion by Bleeker (1874: 71); previously listed as *Aleuteres laevis* by Guichenot (1863: C31); record confirmed by Fricke (1999: 590), based on MHNRUN material.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar. Marine species. Found in lagoon and seaward coral and rocky reefs, occasionally under floating objects; juveniles may travel with weed rafts in open ocean for a long time; at depths of 3–120 m. Outside the area, worldwide in tropical and subtropical seas.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Amanses scopas* (Cuvier, 1829) – Broom filefish

Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 102); record confirmed by Fricke (1999: 590–591), based on LEMUR material.

Distribution. Réunion, Mauritius, Madagascar, Seychelles. Marine species. Found in clear coastal to outer reefs, usually in rich coral areas with rubble patches or gutters, at depths of 1–18 m. Outside the area, Red Sea and East Africa east to Hawaiian and Tuamotu islands, north to southern Japan and Ogasawara Islands, south to southern Great Barrier Reef/ Australia.

Conservation. Endangered in Réunion (EN). Threats: HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action.

*Cantherhines dumerilii* (Hollard, 1854) – Barred filefish; Bourse à taches blanches

Taxonomy. First record from Réunion by Hutchins & Tyler (1984a: 2 unnumbered pp.); previously listed as *Amanses sandwichiensis* (non Quoy & Gaimard, 1824) by Blanc & Postel (1958: 369); record confirmed by Fricke (1999: 591), based on MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Comores. Marine species. Found in offshore coral and rocky reefs, at depths of 1–35 m. Outside the area, Red Sea and East Africa east to Mexico, north to southern Japan and Ogasawara Islands, south to Lord Howe, Rapa and Ducie islands.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Cantherhines fronticinctus* (Günther in Playfair & Günther, 1867) – Spectacled filefish; Bourse à lunette

Taxonomy. First record from Réunion by Hutchins & Randall (1982: 176–179); record confirmed by Fricke (1999: 591–592), based on BPBM material.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar. Marine species. Found in seaward reefs, usually in rich coral with various other mixed-invertebrate habitat, at depths of 0–43 m. Outside the area, East and South Africa east to Marshall Islands and Tonga, north to southern Japan, south to northwestern Australia.

Conservation. Endangered in Réunion (EN). Threats: HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action.

*Cantherhines pardalis* (Rüppell, 1837) – Honeycomb filefish; Bourse rayon de miel

Taxonomy. First record from Réunion by Hutchins & Tyler (1984a: 2 unnumbered pp.); record confirmed by Fricke (1999: 592), based on LEMUR and MHNRUN material.

Distribution. Réunion, Mauritius, Rodrigues, Madagascar. Marine species. Found in outer coral and rocky reef slopes, often in silty habitat, sometimes with drifting seagrass, at depths of 0–20 m. Outside the area, Red Sea, East and South Africa east to Marquesas Islands and Pitcairn Group, north to southern Japan and Ogasawara Islands, south to Lord Howe and Rapa islands.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Oxymonacanthus longirostris* (Bloch & Schneider [ex Seba], 1801) – Harlequin filefish; Poisson lime à taches oranges

Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 102); record confirmed by Fricke (1999: 592–593), based on LEMUR material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Marine species. Found in clear lagoon

and seaward reefs with live *Acropora* corals, at depths of 1–30 m. Outside the area, East Africa east to Samoa, north to Ryukyu and Ogasawara islands, south to southern Great Barrier Reef/Australia, New Caledonia and Tonga.
Conservation. Critically endangered in Réunion (CR). Threats: PRL, HAB, EUT. Very sensitive to human activities. Severe decline. High priority for conservation action. Proposed for Annex II of the EU Habitats Directive.

*Paraluteres prionurus* (Bleeker, 1851) – Blacksaddle mimic; Faux poisson coffre
Taxonomy. First record from Réunion by Letourneur (1992: 40); record confirmed by Fricke (1999: 593–594), based on LEMUR and MNHN material.
Distribution. Réunion, Mauritius. Marine species. Found in clear lagoon and seaward coral and rocky reefs, at depths of 1–25 m. Outside the area, East and South Africa east to Marshall Islands, north to southern Japan and Ogasawara Islands, south to Great Barrier Reef/Australia and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Paramonacanthus pusillus* (Rüppell, 1829) – Pygmy filefish
Taxonomy. First record from Réunion by Fricke (1999: 594), based on SMNS material.
Distribution. Réunion. Marine species. Found on rocky or coral reefs, at depths of 1–73 m. Outside the area, East and South Africa east to Sri Lanka.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Pervagor aspricaudus* (Hollard, 1854) – Orangetail filefish
Taxonomy. First record from Réunion by Chabanet (1994: 242); previously listed as *P. melanocephalus* (non Bleeker, 1853) by Harmelin-Vivien (1976: 102); record confirmed by Fricke (1999: 594), based on SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar. Marine species. Found in clear lagoon and seaward coral and rocky reefs, at depths of 1–25 m. Outside the area, antiequatorial in Indo-West Pacific, east to Hawaiian Islands.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Pervagor janthinosoma* (Bleeker, 1854) – Blackbar filefish
Taxonomy. First record from Réunion by Letourneur (1991: 164); record confirmed by Fricke (1999: 595), based on LEMUR and SMNS material.
Distribution. Réunion, Mauritius, Rodrigues. Marine species. Found in coral-rich areas of clear lagoon and seaward reefs, at depths of 1–20 m. Outside the area, East and South Africa east to Caroline and Tongan islands, north to southern Japan and Ogasawara Islands, south to New South Wales/Australia.
Conservation. Endangered in Réunion (EN). Threats: HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action.

*Pseudalutarius nasicornis* (Temminck & Schlegel, 1850) – Rhino leatherjacket
Taxonomy. First record from Réunion as *Pseudaluteres nasicornis* by Bleeker (1874: 71); previously listed as *Aluteres rhinoceros* by Guichenot (1863: C31).
Distribution. Réunion, Mauritius, Madagascar, Seychelles. Transitional water and marine. Found in coastal reefs and entering estuaries; often in silty habitat and usually on slopes with low rubble reef and rich invertebrate growth, at depths of 1–55 m. Outside the area, East and South Africa east to New Guinea, north to southern Japan, south to New South Wales/Australia and New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Thamnaconus fajardoi* Smith, 1953 – Spotted filefish
Taxonomy. First record from Réunion by Hutchins & Tyler (1984a: 2 unnumbered pp.); record confirmed by Letourneur et al. (2004: 216).
Distribution. Réunion, Mauritius, Mozambique Channel, Madagascar. Marine species. Demersal, at depths of 130–150 m. Endemic to islands in the southwestern Indian Ocean.
Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitive to human activities. Decline unknown. Low priority for conservation action.

*Thamnaconus modestoides* (Barnard, 1927) – Modest filefish
Taxonomy. First record from Réunion by Durville et al. (submitted), based on MHNRUN material.
Distribution. Réunion. Marine species. Found on deep reefs, at depths of 73–200 m. Outside the area, South Africa east to Indonesia, north to southern Japan, south to northwestern Australia.
Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitive to human activities. Decline unknown. Low priority for conservation action.

### Ostraciidae – Boxfishes

*Lactoria cornuta* (Linnaeus, 1758) – Longhorn cowfish; Coffre (Réunion), coffre boufle (France)
Taxonomy. First record from Réunion as *Ostracion cornutus* by Guichenot (1863: C31); *Ostracion horridus* Desjardins in Lienard, 1836 (Liénard 1836: 64, holotype: NHMI uncat., dry specimen) is a junior synonym; record of *Lactoria cornuta* confirmed by Fricke (1999: 596), based on MHNRUN and MNHN material.
Distribution. Réunion, Mauritius, Madagascar, Seychelles. Transitional water and marine. Found inshore on coastal muddy or sandy habitats in still bays, common in harbours and estuaries, at depths of 1–100 m. Outside the area, Red Sea, East and South Africa east to Marquesas and Tuamotu islands, north to South Korea, central Japan and Ogasawara Islands, south to Lord Howe Island.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Ostracion cubicus* Linnaeus, 1758 – Yellow boxfish; Coffre jaune
Taxonomy. First record from Réunion by Guichenot (1863: C31); subsequently listed as *Ostracion (Ostracion) tetragonus* and *O. (Acanthostracion) argus* by Bleeker (1874: 70), and as *O. tuberculatus* by Harmelin-Vivien (1976: 102); record confirmed by Fricke (1999: 597–599), based on LEMUR, MHNRUN, MNHN and SMNS material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles. Marine species. Found in lagoon and semi-sheltered seaward reefs; juveniles often among *Acropora* corals; at depths of 0–280 m. Outside the

area, Red Sea, East and South Africa east to Tuamotu Archipelago, north to Ryukyu and Ogasawara islands, south to northern New Zealand, Lord Howe and Rapa islands, straying to Hawaiian Islands.
Conservation. Endangered in Réunion (EN). Threats: HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action.

*Ostracion meleagris* Shaw in Shaw & Nodder, 1796 – White-spotted boxfish; Coffre pintade
Taxonomy. First record from Réunion by Letourneur (1991: 164); previously listed as *O. Punctatus* by Guichenot (1863: C31), and as *O. sebae* by Harmelin-Vivien (1976: 102); record confirmed by Fricke (1999: 599–600), based on LEMUR, MHNRUN, MNHN, SMNS and USNM material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar. Marine species. Found in clear lagoon and seaward reefs; juveniles among rocky boulders, adults on reef crests and slopes; at depths of 0–30 m. Outside the area, East and South Africa east to Mexico, north to southern Japan, Ogasawara and Hawaiian islands, south to Great Barrier Reef/ Australia, New Caledonia and Rapa.
Conservation. Endangered in Réunion (EN). Threats: HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action.

*Ostracion trachys* Randall, 1975 – Roughskin trunkfish
Taxonomy. First record from Réunion by Letourneur et al. (2004: 216), based on a specimen observed by E. Tessier.
Distribution. Mauritius. Marine species. Found in holes and crevices of coral reefs, at depths of 10–20 m. Endemic to the western Mascarenes.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Tetrosomus concatenatus* (Bloch, 1786) – Triangular boxfish; Coffre (Réunion)
Taxonomy. First record from Réunion as *Ostracion concatenatus* and *O. triqueter* by Guichenot (1863: C31); record confirmed by Fricke (1999: 600–601), based on MHNRUN material.
Distribution. Réunion, Mauritius, Seychelles. Transitional water and marine. Found in shallow water, entering muddy bays or estuaries, usually with large remote sponges, at depths of 0–60 m. Outside the area, East and South Africa east to Philippines, north to southern Japan, south to Lord Howe Island.
Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

### Triodontidae – Threetooth pufferfishes

*Triodon macropterus* Lesson, 1831 – Threetooth puffer; Bourse de fond
Taxonomy. First record from Réunion by Fricke (1999: 601), based on MHNRUN material; previously listed as *T. bursarius* by Guichenot (1863: C31).
Distribution. Réunion, Mauritius. Transitional water and marine. Found inshore on coastal muddy or sandy habitats in still bays, common in estuaries, at depths of 1–100 m. Outside the area, East Africa east to Philippines, north to southern Japan, south to New Caledonia.
Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action.

### Tetraodontidae – Pufferfishes

*Arothron caeruleopunctatus* Matsuura, 1994 – Blue-spotted puffer
Taxonomy. Originally described in part from Réunion by Matsuura (1994: 29–32); record confirmed by Fricke (1999: 602), based on NSMT material.
Distribution. Réunion, Mauritius. Marine species. Found in clear lagoon and seaward coral reefs, at depths of 2–50 m. Outside the area, Maldives east to Papua New Guinea, north to southern Japan, south to Coral Sea.
Conservation. Endangered in Réunion (EN). Threats: HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/ SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Arothron hispidus* (Linnaeus, 1758) – White-spotted puffer; Bouvetanne (Réunion), compère à taches blanches (France)
Taxonomy. First record from Réunion as *Dilobomycterus hispidus* by Guichenot (1863: C31); record confirmed by Fricke (1999: 602–603), based on MHNRUN and MNHN material.
Distribution. Réunion, Mauritius, Madagascar, Seychelles. Transitional water and marine. Found in outer coral reef slopes, inner reef flats and lagoons; juveniles seagrass areas including estuaries; at depths of 1–50 m. Outside the area, Red Sea, East and South Africa east to Panama, north to southern Japan, Ogasawara and Hawaiian islands, south to Lord Howe and Rapa islands.
Conservation. Vulnerable in Réunion (VU). Threats: HAB, EUT. Sensitive to human activities. Significant decline. Low priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/ DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Arothron immaculatus* (Bloch & Schneider [ex Lacepède, ex Commerson], 1801) – Immaculate puffer
Taxonomy. First record from Réunion as *Tetrodon immaculatus* by Playfair & Günther (1867: 132); previously listed by Guichenot (1863: C31) as *Dilobomycterus sordidus*; record confirmed by Fricke (1999: 603–604), based on MNHN and USNM material.
Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Transitional water and marine. Found in lagoon habitats with seagrass beds adjacent to coral reefs, often entering estuaries, at depths of 0–17 m. Outside the area, Red Sea, East and South Africa east to Philippines, north to Ryukyu Islands, south to northern Australia.
Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/ DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Arothron mappa* (Lesson, 1831) – Map puffer
Taxonomy. First record from Réunion by Fricke (1999: 604), based on an underwater photograph.
Distribution. Réunion, Mauritius. Marine species. Found in in clear lagoon and sheltered seaward reefs; adults usually

along deep drop-offs, at depths of 1–30 m. Outside the area, East and South Africa east to Samoa, north to Ryukyu Islands, south to southern Queensland/Australia and New Caledonia.

Conservation. Critically endangered in Réunion (CR). Threats: HAB, EUT. Rare. Very sensitive to human activities. Significant decline. High priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Arothron meleagris* (Anonymus [ex Lacepède, ex Commerson], 1798) – Guineafowl puffer; Compère pintade

Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 103).

Distribution. Réunion, Mauritius, Aldabra, Agalega Islands, Seychelles, Cargados Carajos. Marine species. Found in coral-rich areas of clear lagoon and seaward reefs, at depths of 2–24 m. Outside the area, East and South Africa east to Panama, north to Ryukyu and Ogasawara islands, south to Lord Howe and Easter islands.

Conservation. Endangered in Réunion (EN). Threats: HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Arothron nigropunctatus* (Bloch & Schneider, 1801) – Blackspotted puffer; Compère à taches noires

Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 103); record confirmed by Fricke (1999: 605), based on LEMUR, MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Marine species. Found on coastal to outer reef crest and slope habitats with rich invertebrate growth, at depths of 3–25 m. Outside the area, Red Sea, East and South Africa east to Line and Tuamotu islands, north to Ryukyu and Ogasawara islands, south New South Wales/Australia and New Caledonia.

Conservation. Endangered in Réunion (EN). Threats: HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Arothron stellatus* (Anonymus [ex Lacepède, ex Commerson], 1798) – Star puffer; Compère étoilé

Taxonomy. First record from Réunion by Harmelin-Vivien (1976: 103); record confirmed by Fricke (1999: 605–606), based on MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Cargados Carajos, Seychelles. Marine species. Found in patch reefs and coral reef slopes near sandy areas of clear lagoon and seaward reefs; juveniles occur in sandy and seagrass inner reefs; at depths of 1–58 m. Outside the area, Red Sea, East and South Africa east to Tuamotu Archipelago, north to southern Japan and Ogasawara Islands, south to Lord Howe Island and northern New Zealand.

Conservation. Endangered in Réunion (EN). Threats: HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action. Proposed for Annex II of the EU Habitats Directive. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Canthigaster amboinensis* (Bleeker, 1865) – Spotted toby

Taxonomy. First record from Réunion by Letourneur (1992: unpag. 8); previously listed by Harmelin-Vivien (1976: 103) as *C. margaritatus* (non Rüppell, 1829); record confirmed by Fricke (1999: 606–607), based on BPBM, MNHN and SMNS material.

Distribution. Réunion, Mauritius, Comores, Madagascar, Seychelles. Marine species. Found on coral and rocky reefs, often in high energy zones, at depths of 0–16 m. Outside the area, East and South Africa east to Galapagos Archipelago, north to southern Japan and Hawaiian Islands, south to Great Barrier Reef/Australia and Society Islands.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Canthigaster bennetti* (Bleeker, 1854) – Exquisite toby

Taxonomy. First record from Réunion by Letourneur (1992: unpag. 8); record confirmed by Fricke (1999: 607), based on SMNS material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Aldabra, Seychelles. Marine species. Found on coral and rocky reefs, often in high energy zones, at depths of 0–16 m. Outside the area, East and South Africa east to Tuamotu Archipelago, north to southern Taiwan, south to northern New South Wales/Australia.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Canthigaster cyanospilota* Randall, Williams & Rocha, 2008 – Crowned toby

Taxonomy. First record from Réunion by Randall et al. (2008: 7–10), recorded as *C. coronata* (non Vaillant & Sauvage, 1875) by Fricke (1999: 607), based on BPBM material.

Distribution. Réunion, Mauritius, Seychelles. Marine species. Found on sand and rubble bottoms of seaward reefs, at depths of 6–100 m. Outside the area, Red Sea, East and South Africa. *Canthigaster coronata* (Vaillant & Sauvage, 1875) is now restricted to the Hawaiian Islands.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Canthigaster inframacula* Allen & Randall, 1977 – Spotbelly toby

Taxonomy. First record from Réunion by Durville et al. (submitted), based on MHNRUN material.

Distribution. Réunion. Marine species. Found on deep reefs, at depths of 124–274 m. Outside the area, southern Japan; Hawaiian Islands.

Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitive to human activities. Decline unknown. Low priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Canthigaster janthinoptera* (Bleeker, 1855) – Honeycomb toby

Taxonomy. First record from Réunion as *C. janthinopterus* by Harmelin-Vivien (1976: 103); record confirmed by Fricke (1999: 607–608), based on LEMUR and SMNS material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Agalega Islands, Seychelles. Marine species. Found in clear lagoon and seaward reefs, at depths of 0–30 m. Outside the area, East and South Africa east to Marquesas and Pitcairn islands, north to Ogasawara Islands, south to Lord Howe Island.

Conservation. Endangered in Réunion (EN). Threats: HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Canthigaster natalensis* (Günther, 1870) – Natal toby

Taxonomy. First record from Réunion by Allen & Randall (1977: 500–501); record confirmed by Fricke (1999: 608), based on SMNS and USNM material.

Distribution. Réunion, Mauritius. Marine species. Found in clear lagoon and seaward coral reefs, at depths of 0–30 m. Outside the area, East and South Africa.

Conservation. Endangered in Réunion (EN). Threats: HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Canthigaster rivulata* (Temminck & Schlegel, 1850) – Double-line toby

Taxonomy. First record from Réunion by Fricke (1999: 608); previously listed by Harmelin-Vivien (1976: 103) as *C. caudofasciatus*.

Distribution. Réunion, Mauritius, Agalega Islands, Seychelles, Cargados Carajos. Marine species. Found in coral and rocky reefs, at depths of 0–350 m. Outside the area, East and South Africa east to Hawaiian Islands, north to South Korea, southern Japan and Ogasawara Islands, south to Western Australia and New Caledonia.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Canthigaster smithae* Allen & Randall, 1977 – Bicoloured toby

Taxonomy. First record from Réunion by Letourneur (1992: 53).

Distribution. Réunion, Mauritius, Aldabra, Seychelles. Marine species. Found on outer reef slopes, at depths of 20–37 m. Outside the area, East and South Africa east to Maldives.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Canthigaster solandri* (Richardson [ex Solander], 1845) – Spotted sharpnose

Taxonomy. First record from Réunion by Letourneur (1992: 121); record verified based on specimens observed and photographed during a visual census, on the outer and inner coral reef, in 2007 (T. Cadet, T. Mulochau, P. Durville, E. Tessier).

Distribution. Réunion, Mauritius. Marine species. Found on sheltered rocky and coral reefs and in lagoons, including intertidal areas, at depths of 0–36 m. Outside the area, East Africa east to Hawaiian and Tuamotu islands, north to Ryukyu Islands, south to New Caledonia.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Rare. Sensitive to human activities. Probable decline. Medium priority for conservation action.

*Canthigaster valentini* (Bleeker, 1853) – Black-saddled toby

Taxonomy. First record from Réunion as *Canthogaster Valentijni* by Bleeker (1874: 69); previously listed by Guichenot (1863: C31) as *Rhynchotus Gronovii*; record confirmed by Fricke (1999: 609–611), based on BPBM, LEMUR and SMNS material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Marine species. Found in coastal reefs and lagoon habitats, at depths of 0–55 m. Outside the area, Red Sea, East and South Africa east to Tuamotu Archipelago, north to South Korea, southern Japan and Ogasawara Islands, south to Lord Howe Island.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Lagocephalus lagocephalus* (Linnaeus, 1758) – Oceanic puffer

Taxonomy. First record from Réunion as *Promecocephalus lagocephalus* by Guichenot (1863: C31); record confirmed by Fricke (1999: 611), based on MHNRUN and MNHN material.

Distribution. Réunion, Mauritius. Transitional waters and marine. An oceanic, pelagic species which may come inshore and enter estuaries; at depths of 0–476 m. Outside the area, worldwide in tropical and temperate oceans, except for Red Sea.

Conservation. Data deficient in Réunion (DD). Threats: FIB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Lagocephalus sceleratus* (Gmelin [ex Forster], 1789) – Silverstripe puffer; Ballon à bande argentée

Taxonomy. First record from Réunion as *Tetrodon sceleratus* by Bleeker (1874: 69); previously listed by Guichenot (1863: C31) as *Promecocephalus argentatus*; record confirmed by Fricke (1999: 611–612), based on MHNRUN material.

Distribution. Réunion, Mauritius, Madagascar, Aldabra, Seychelles. Marine species. Found on offshore coral reefs, at depths of 18–100 m. Outside the area, Red Sea, East and South Africa east to Philippines, north to southern Japan, south to southern Australia.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Very sensitive to human activities. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Takifugu oblongus* (Bloch, 1786) – Lattice puffer; Bouvetanne (Réunion)

Taxonomy. First record from Réunion as *Amblyrhynchotes oblongus* by Guichenot (1863: C31); record confirmed by Fricke (1999: 612), based on MHNRUN material.

Distribution. Réunion, Madagascar. Transitional waters and marine. Found in shallow coastal waters, entering brackish water, at depths of 0–20 m. Outside the area, East and South Africa east to Indonesia, north to southern Japan, south to northern Australia.

Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Tylerius spinosissimus* (Regan, 1908) – Spiny blaasop

Taxonomy. First record from Réunion by Durville et al. (submitted), based on MHNRUN material.

Distribution. Réunion. Marine species. Bathydemersal, at depths of 250–435 m. Outside the area, South Africa to Indonesia, north to South China Sea, south to northwestern Australia, Queensland/Australia and New Caledonia.

Conservation. Data deficient in Réunion (DD). Threats: EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

## Diodontidae – Porcupinefishes

*Chilomycterus reticulatus* (Linnaeus, 1758) – Spotfin burrfish; Bouvetanne (Réunion)

Taxonomy. First record from Réunion by Fricke (1999: 612), based on MHNRUN and MNHN material; previously listed by Guichenot (1863: C30) as *C. tigrinus*; record confirmed by Leis (2006: 80–81).

Distribution. Réunion, Mauritius, Comores. Marine species. Found in coral reefs and over soft bottoms, juveniles in floating seagrass; at depths of 10–140 m. Outside the area, worldwide in warm temperate oceans.

Conservation. Vulnerable in Réunion (VU). Threats: HAB, EUT. Sensitive to human activities. Significant decline. High priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Cyclichthys orbicularis* (Bloch, 1785) – Birdbeak burrfish; Bouvetanne (Réunion)

Taxonomy. First record from Réunion as *Diodon orbicularis* by Guichenot (1863: C30); record confirmed by Fricke (1999: 613), and Leis (2006: 82).

Distribution. Réunion, Mauritius. Marine species. Found in clear protected coral reefs with sponge and algal habitats, at depths of 9–170 m. Outside the area, Red Sea, East and South Africa east to Philippines, north to South China Sea, south to Lord Howe Island.

Conservation. Endangered in Réunion (EN). Threats: HAB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Cyclichthys spilostylus* (Leis & Randall, 1982) – Spotbase burrfish

Taxonomy. First record from Réunion by Durville et al. (submitted), based on MHNRUN material.

Distribution. Réunion. Marine species. Found in coral and rocky reefs, at depths of 3–90 m. Outside the area, Red Sea, East and South Africa east to Philippines, north to southern Japan, south to northern Queensland/Australia and New Caledonia, immigrated into eastern Mediterranean through Suez Canal.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Decline unknown. Low priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Diodon holocanthus* Linnaeus, 1758 – Balloon porcupinefish; Porc-épic ballon

Taxonomy. First record from Réunion by Leis (1984: 2 unnumbered pp.); record confirmed by Fricke (1999: 613), based on MHNRUN material.

Distribution. Réunion, Mauritius, Madagascar. Marine species. Found in shallow coral reefs to open, soft bottoms, at depths of 0–200 m. Outside the area, nearly circumtropical.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Diodon hystrix* Linnaeus, 1758 – Porcupinefish; Bouletangue (Réunion)

Taxonomy. First record from Réunion by Guichenot (1863: C30); record confirmed by Fricke (1999: 613–614), based on MHNRUN and MNHN material.

Distribution. Réunion, Mauritius, Rodrigues, Comores, Madagascar, Seychelles. Marine species. Found in lagoon and seaward coral or rocky reefs, often in caves and holes in shallow reefs, at depths of 0–50 m. Outside the area, in all tropical oceans.

Conservation. Data deficient in Réunion (DD). Threats: HAB, EUT. Sensitive to human activities. Probable decline. Medium priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Diodon liturosus* Shaw [ex Lacepède, ex Commerson], 1804 – Black-blotched porcupinefish; Porc-épic tacheté

Taxonomy. First record from Réunion by Fricke (1999: 614); previously listed by Günther (1870: 307–308, part, var. d) as *D. maculatus*; record confirmed by Leis (2006: 88).

Distribution. Réunion, Mauritius. Marine species. Found on coral reef edges and slopes, often in caves and holes in shallow reefs, juveniles in lagoon habitats; at depths of 0–90 m. Outside the area, South Africa east to Society Islands, north to southern Japan.

Conservation. Vulnerable in Réunion (VU). Threats: HAB, EUT. Sensitive to human activities. Significant decline. High priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté n° 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

M o l i d a e – Sunfishes

*Masturus lanceolatus* (Liénard, 1840) – Sharptail mola
Taxonomy. **New record** from Réunion, based on a photographed specimen collected by a local fisherman, 10 miles west of Réunion, in 2005 (P. DURVILLE, T. MULOCHAU).
Distribution. Réunion, Mauritius. Marine species. Pelagic, at depths of 50–670 m. Outside the area, worldwide in tropical and warm temperate oceans.
Conservation. Threatened migrant in Réunion (TM). Threats: FIB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté nº 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Mola mola* (Linnaeus, 1758) – Ocean sunfish; Lune (Réunion)
Taxonomy. First record from Réunion as *Orthagoriscus mola* by GUICHENOT (1863: C31); record confirmed by FRICKE (1999: 615), based on MHNRUN material.
Distribution. Réunion, Mauritius. Marine species. Pelagic, at depths of 10–480 m. Outside the area, worldwide in tropical and temperate oceans.
Conservation. Threatened migrant in Réunion (TM). Threats: FIB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté nº 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

*Ranzania laevis* (Pennant, 1776) – Trunkfish; Ranzania
Taxonomy. First record from Réunion by FRICKE (1999: 615), based on MHNRUN and SMNS material.
Distribution. Réunion, Mauritius, Madagascar. Marine species. Pelagic, at depths of 0–140 m. Outside the area, worldwide in tropical and temperate oceans.
Conservation. Threatened migrant in Réunion (TM). Threats: FIB, EUT. Very sensitive to human activities. Significant decline. High priority for conservation action. Banned from commercial exploitation in La Réunion due to Arrêté nº 06-2412/SG/DRCTCV (Anonymus 2006a), as to avoid ciguatera poisoning.

## 4 The fish fauna of Réunion and its endemism

The fish fauna of Réunion comprises a total of 984 species in 164 families. 16 of these species are not native, but have been introduced. 6 fish families are represented only by introduced species. The native fish fauna of Réunion therefore consists of 968 species in 158 families. The largest families are the Labridae (63 native species, 6.5 % of the native species), Serranidae (54 native species, 5.6 %), Gobiidae (53 native species, 5.5 %), Pomacentridae (45 native species, 4.7 %), Blenniidae (34 native species, 3.5 %), Carangidae (33 native species, 3.4 %), Muraenidae (32 native species, 3.3 %), Acanthuridae (28 native species, 2.9 %), Lutjanidae (27 native species, 2.8 %), and Chaetodontidae, Holocentridae and Scorpaenidae and Holocentridae (24 native species each, 2.5 %). Typically for tropical volcanic islands, the freshwater fish fauna is dominated by the families Gobiidae, Eleotridae and Anguillidae; the most speciate marine fish groups are the Labridae, Serranidae and Gobiidae. A total of 63 fish species are recorded for the first time from Réunion.

The fish fauna of Réunion includes a total of 65 species occurring in freshwater (plus 16 introduced species, 23.1 % of the total freshwater fish species), 165 species of transitional waters (plus 16 introduced species, 9.7 % of the total transitional water species) and 965 species in marine habitats (plus two introduced species, 0.2 % of the total marine species). The freshwater element includes 41 riverine species (4.2 % of the naturally occurring species of Réunion), four katadromously migrating eels (0.4 %), and 13 oceanic stragglers (1.3 %). In transitional waters, 107 species are estuarine (11.1 %), four are katadromously migrating eels (0.4 %), 28 are oceanic stragglers (2.9 %) and six are freshwater stragglers (0.6 %). The marine habitats are most diverse; 549 species (56.7 %) are found in one of the smallest habitats, e. g. shallow coral reefs (0–80 m depth), 115 species (11.9 %) on the reef flat/reef crest, 271 species (28.0 %) occur in shallow rocky reefs, 82 species (8.5 %) in tidal pools, and 136 species (14.0 %) are known from deep reefs; 326 species (33.7 %) live inside the fringing reef, 163 species (16.8 %) on sand bottom, 74 species (7.6 %) on seagrass/algae, 74 species (7.6 %) on coral rubble/gravel, and 57 species (5.9 %) on mud bottoms; 26 species (2.7 %) are found demersal, 32 species (3.3 %) bathydemersal, 73 species (7.5 %) oceanic pelagic, 49 species (5.1 %) coastal pelagic, 20 species (2.1 %) are known benthopelagic, and 16 species (1.7 %) bathypelagic. Obviously, the deep water and deep sea fish fauna of Réunion is still very incompletely known.

Zoogeographically, the main element of the fish fauna of Réunion consists of widespread tropical Indo-Pacific species (631 species, 65 % of the total naturally occurring species), of which 576 species (60 %) have a typical Indo-West Pacific distribution, 46 species (4.8 %) an Indo-Pacific distribution including the East Pacific, and 10 species (1.0 %) an antitropical/antiequatorial distribution. A total of 121 species (12.5 %) are found worldwide, either circumtropical (103 species, 10.7 %), antitropical (seven species, 0.7 %), or Southern Hemisphere temperate (seven species, 0.7 %). Five species (0.5 %) are found in the Atlantic and Indian Oceans. An additional 202 species (20.9 %) are Indian Ocean endemics, including 83 western Indian Ocean endemics (8.6 %), 44 southwestern Indian Ocean endemics (4.5 %), 12 species (1.2 %) endemic to the Mascarenes, Madagascar and Comores, and 25 Mascarene Islands endemics (2.6 %). Seven species are only known from Réunion (*Apolemichthys guezei*, *Channomuraena bauchotae*, *Mimoblennius lineathorax*, *Oxyurichthys guibei*, *Parupeneus diagonalis*, *Parupeneus posteli*, *Upeneus mascareinsis*), which results in an endemism rate of 0.7 %; 18 species (1.9 %) are Mascarene endemics excluding those species only occurring in Réunion (*Abudefduf mar-*

*gariteus*, *Anisochromis mascarenensis*, *Callionymus agilis*, *Cotylopus acutipinnis*, *Dodekablennos fraseri*, *Entomacrodus lemuria*, *Hetereleotris georgegilli*, *Hypoplectrodes huntii*, *Laemonema macronema*, *Neobythites multistriatus*, *Plectroglyphidodon randalli*, *Pomacentrus pikei*, *Pterygotrigla guezei*, *Soleichthys tubifera*, *Springeratus polyporatus*). The Mascarenes are considered as an endemism centre (FRICKE 1999: 616). The relatively low endemism rate of Réunion (compared with Mauritius) is probably due to the geological youth of the island, which existed only for approximately 2.1 million years. When compared with other Indian Ocean islands, the endemism rate is still relatively high (e. g. 0.4 % endemics at Chagos Archipelago according to WINTERBOTTOM & ANDERSON 1997: 26). It is expected that some of the western Mascarene endemics originated in Mauritius and migrated to Réunion; the shelves of the two islands are only 170 km apart. Though the main current (southern Indian Ocean equatorial current) is running from Mauritius to Réunion most of the time, there may be an anomalous current reversal.

## 5 Conservation

The following chapter is an attempt to summarise the conservation status of fish species and aquatic habitats in Réunion.

While Réunion was found pristine and mostly untouched by humans in 1513, the terrestrial fauna of the island heavily suffered from overexploitation and settlement activities since the 17th century. The population has meanwhile raised to 793,000 (2007), with an overall population density of 393 inhabitants per km$^2$; the actual population pressure on the fragile coastal habitats is even higher, as most of the inhabitants live along the northern and western shores of the island, leaving much of the centre and the southeastern parts uninhabited. A larger number of endemic birds, reptiles, molluscs and mammals was extirpated in the 17th and 18th centuries (e. g. COWLES 1994: 87–93, MICKLEBURGH et al. 2004).

Due to rapid economic and agricultural development and population growth during the past centuries and decades, the native fish fauna of Réunion is now highly threatened and needs urgent political action to ensure its conservation. The marine fish species of Réunion are generally threatened by eutrophication/pollution out of inflowing rivers and coastal towns, by overfishing and poaching, and by construction along the shore, especially hotels in tourist areas. Additional threats include the expansion of coastal cities, the construction of coastal roads, and marine aquaculture which pollutes and eutrophicates the surrounding marine waters, and threatens native marine species by escaping aquaculture fish material. Anonymus (2006b) estimates the 2005 aquaculture production at 150 tonnes of fish, with 20 % marine, i. e. 30 tonnes. Additional regional threats include long-ranging marine eutrophication and pollution, with sources in Indian Ocean abutting nations like Australia, India or Indonesia; also the destruction of coastal areas, marine acidification (which poses a threat to corals and some fish species), and global warming (threatening cool water species).

The marine fauna was mainly exploited since the 19th century, with continuously increasing exploitation levels. In 2000, the total marine fisheries of Réunion was estimated at over 10000 tonnes a year, in 2004, at over 11500 tonnes (Anonymus 2006b). The Réunion fishing fleet (Anonymus 2006b) comprises 300 relatively new vessels (2004 data); the main fisheries consists of small scale coastal fisheries, longline fisheries of large pelagic fish, and 'Southern Ocean' fishing. In the coastal fisheries, the annual declared catches range totals between 1500 and 2500 tonnes, but the total catch is most likely higher; there is no accurate gauging of the fishing effort and it is clear that stocks in the coastal regions are being over-fished. For the pelagic longline fisheries, the annual catch is estimated at approximately 3000 tonnes. South of Réunion, the total fishing effort is approximately 6000 tonnes per year. There is a substantial swordfish and tuna fishing by foreign vessels, accounting for 0.25 % of the Indian Ocean's tuna catches, the Réunion fleet plays but a marginal role in this over-fishing.

The coral reefs, as the marine habitat with highest diversity, suffered from a number of anthropogenic factors, including legal fishing and poaching on protected areas and/or on protected species, walking on the reef crest, eutrophication, marine pollution, marine acidification and global warming. AHAMADA et al. (2002: 86–87) discussed the status of the coral reefs of La Réunion. Between 1999 and 2002, they observed a relative stability of the coral reef habitats in 14 monitoring stations (40–50 % coral cover in February 2002), and found a balance between the degradation from human activities and new coral growth, but a slight decrease in the coral cover on the outer slopes. They observed that the fish populations were relatively stable, with a low level of predatory fish, which showed, even in protected zones, continued fishing pressures. CARPENTER et al. (2008), however, found a high percentage of reef-building corals facing elevated extinction levels, and concluded that coral reef habitats are in urgent need of conservation efforts.

Meanwhile, several species of fishes have been banned from commercial exploitation due to the risk of ciguatera infection (Anonymus 2006a). Furthermore, a marine reserve was established in La Réunion on 21 February 2007 (Anonymus 2007). In the marine reserve, the introduction of non-domestic species, poaching, disturbing the ecosystems acoustically or with light, use of toxic substances for

fishing, fishing methods that affect corals, trawling and dredging, sand, coral or rock extraction or collection, etc. are forbidden, and there are several additional restrictions. Within the reserve, 197 hectares of special marine protected areas (MPA) were established for coral reef habitats, where any activities are forbidden (Trois Chameaux à l'Hermitage, Trou d'Eau, Pointe des Châteaux, Varangue, l'Étang Salé).

Freshwater habitats are supported by rainfall which may be extremely heavy at times, such as during hurricanes. The island of Réunion is divided by its high mountains in two climatic halves; the windward eastern, wetter half (Côte au Vent), and the leeward western, dry half (Côte sous le Vent). Streams and rivers are usually relatively steep and fast-flowing; some of those on the leeward side are seasonal only. There are generally two seasons: a wet season from December to April, and a dry season from May to November. Since a lot of agriculture and habitation is located in the dry region, there has been a long history of irrigation and water abstraction out of streams and rivers. Water management in the western part has been beyond sustainable levels for a long time. There-

**Tab. 6.** Red List of fish species of Réunion, in taxonomic order. – An asterisk notes a species endemic to Réunion.

**RE (Regionally extinct)**

| | | |
|---|---|---|
| *Carcharhinus melanopterus* | *Herklotsichthys spilurus* | *Terapon jarbua* |
| *Pristis microdon* | *Chanos chanos* | *Plectorhinchus gaterinus* |
| *Pristis pectinata* | *Gonorynchus gonorynchus* | *Drepane punctata* |
| *Elops machnata* | *Hyporhamphus erythrorinchus* | *Pomacanthus semicirculatus* |
| *Megalops cyprinoides* | *Aethaloperca rogaa* | *Hypseleotris cyprinoides* |
| *Stolephorus commersonii* | *Plectropomus laevis* | *Platax pinnatus* |

**CR (Critically endangered)**

| | | |
|---|---|---|
| *Carcharodon carcharias* | *Chaetodon meyeri* | *Acanthocybium solandri* |
| *Rhynchobatus djiddensis* | *Chaetodon trifasciatus* | *Allothunnus fallai* |
| *Anguilla bicolor* | *Chaetodon zanzibarensis* | *Auxis rochei* |
| *Anguilla labiata* | *Forcipiger longirostris* | *Thunnus alalunga* |
| *Anguilla marmorata* | *Cirrhitichthys guichenoti* | *Thunnus albacares* |
| *Anguilla mossambica* | *Cirrhitops fasciatus* | *Thunnus obesus* |
| *Remora australis* | *Paracirrhites arcatus* | *Melichthys indicus* |
| *Chaetodon guttatissimus* | *Paracirrhites forsteri* | *Oxymonacanthus longirostris* |
| *Chaetodon melannotus* | *Cheilinus undulatus* | *Arothron mappa* |

**EN (Endangered)**

| | | |
|---|---|---|
| *Alopias superciliosus* | *Gymnocaesio gymnoptera* | *Chlorurus strongylocephalus* |
| *Alopias vulpinus* | *Lethrinus borbonicus* | *Scarus caudofasciatus* |
| *Rhincodon typus* | *Chaetodon trifascialis* | *Scarus falcipinnis* |
| *Albula glossodonta* | **Apolemichthys guezei* | *Scarus frenatus* |
| *Sardinella jussieu* | *Dascyllus carneus* | *Scarus ghobban* |
| *Sardinella melanura* | *Neoglyphidodon melas* | *Scarus globiceps* |
| *Antennarius coccineus* | *Plectroglyphidodon dickii* | *Scarus psittacus* |
| *Antennarius commerson* | *Plectroglyphidodon imparipennis* | *Scarus scaber* |
| *Hippocampus borboniensis* | *Plectroglyphidodon johnstonianus* | *Enneapterygius tutuilae* |
| *Hippocampus jayakari* | *Bodianus diana* | *Helcogramma fuscopinna* |
| *Anyperodon leucogrammicus* | *Bodianus leucosticticus* | *Ecsenius lineatus* |
| *Epinephelus coioides* | *Cheilinus chlorourus* | *Ecsenius midas* |
| *Epinephelus lanceolatus* | *Cheilinus oxycephalus* | *Exallias brevis* |
| *Epinephelus malabaricus* | *Cheilinus trilobatus* | *Plagiotremus rhinorhynchos* |
| *Variola louti* | *Epibulus insidiator* | *Plagiotremus tapeinosoma* |
| *Kuhlia caudavittata* | *Gomphosus caeruleus* | *Cotylopus acutipinnis* |
| *Carangoides coeruleopinnatus* | *Halichoeres hortulanus* | *Eviota distigma* |
| *Caranx ignobilis* | *Halichoeres iridis* | *Eviota indica* |
| *Caranx lugubris* | *Hemigymnus fasciatus* | *Eviota nigripinna* |
| *Caranx melampygus* | *Labrichthys unilineatus* | *Eviota sebreei* |
| *Caranx sexfasciatus* | *Labropsis xanthonota* | *Gobiodon citrinus* |
| *Scomberoides lysan* | *Macropharyngodon cyanoguttatus* | *Gobiodon rivulatus* |
| *Trachinotus baillonii* | *Oxycheilinus digrammus* | *Paragobiodon echinocephalus* |
| *Trachinotus blochii* | *Pseudocheilinus dispilus* | *Paragobiodon modestus* |
| *Aprion virescens* | *Pseudocheilinus octotaenia* | *Periophthalmus kalolo* |
| *Lutjanus bohar* | *Pseudodax moluccanus* | *Pleurosicya micheli* |
| *Lutjanus monostigma* | *Thalassoma hardwicke* | *Sicyopterus lagocephalus* |
| *Caesio caerulaurea* | *Cetoscarus ocellatus* | *Stenogobius polyzona* |

*Acanthurus leucosternon*
*Acanthurus lineatus*
*Paracanthurus hepatus*
*Zebrasoma scopas*
*Zebrasoma velifer*
*Sphyraena acutipinnis*
*Gempylus serpens*
*Lepidocybium flavobrunneum*
*Auxis thazard*
*Euthynnus affinis*
*Gymnosarda unicolor*
*Katsuwonus pelamis*
*Rastrelliger kanagurta*
*Sarda orientalis*
*Scomberomorus commerson*
*Balistapus undulatus*
*Melichthys niger*
*Melichthys vidua*
*Xanthichthys auromarginatus*
*Amanses scopas*
*Cantherhines fronticinctus*
*Pervagor janthinosoma*
*Ostracion cubicus*
*Ostracion meleagris*
*Arothron caeruleopunctatus*
*Arothron meleagris*
*Arothron nigropunctatus*
*Arothron stellatus*
*Canthigaster janthinoptera*
*Canthigaster natalensis*
*Cylichthys orbicularis*

**VU (Vulnerable)**

*Carcharhinus albimarginatus*
*Carcharhinus amblyrhynchos*
*Carcharhinus brevipinna*
*Carcharhinus falciformis*
*Carcharhinus limbatus*
*Carcharhinus longimanus*
*Carcharhinus plumbeus*
*Triaenodon obesus*
*Nebrius ferrugineus*
*Dasyatis thetidis*
*Strophidon sathete*
*Thryssa baelama*
*Amblygaster sirm*
*Dinematichthys iluocoeteoides*
*Agonostomus telfairii*
*Cheilopogon cyanopterus*
*Cheilopogon furcatus*
*Cheilopogon nigricans*
*Cypselurus naresii*
*Cypselurus poecilopterus*
*Exocoetus monocirrhus*
*Exocoetus volitans*
*Parexocoetus brachypterus*
*Prognichthys sealei*
*Ablennes hians*
*Platybelone platyura*
*Strongylura leiura*
*Tylosurus crocodilus*
*Myripristis adusta*
*Myripristis berndti*
*Myripristis botche*
*Myripristis chryseres*
*Myripristis hexagona*
*Myripristis kuntee*
*Myripristis seychellensis*
*Myripristis vittata*
*Neoniphon aurolineatus*
*Sargocentron inaequalis*
*Sargocentron melanospilos*
*Sargocentron seychellense*
*Sargocentron spiniferum*
*Sargocentron tiere*
*Sargocentron tiereoides*
*Halicampus mataafae*
*Caracanthus madagascariensis*
*Scorpaenodes parvipinnis*
*Ambassis ambassis*
*Ambassis gymnocephalus*
*Cephalopholis argus*
*Cephalopholis aurantia*
*Cephalopholis boenak*
*Cephalopholis leopardus*
*Cephalopholis miniata*
*Cephalopholis polleni*
*Cephalopholis sexmaculata*
*Cephalopholis sonnerati*
*Cephalopholis spiloparaea*
*Cephalopholis urodeta*
*Epinephelus chlorostigma*
*Epinephelus coeruleopunctatus*
*Epinephelus flavocaeruleus*
*Epinephelus hexagonatus*
*Epinephelus longispinis*
*Epinephelus macrospilos*
*Epinephelus melanostigma*
*Epinephelus morrhua*
*Epinephelus multinotatus*
*Epinephelus rivulatus*
*Epinephelus spilotoceps*
*Epinephelus tauvina*
*Epinephelus tukula*
*Gracila albomarginata*
*Pseudanthias pulcherrimus*
*Variola albimarginata*
*Kuhlia mugil*
*Kuhlia rupestris*
*Cookeolus japonicus*
*Heteropriacanthus cruentatus*
*Priacanthus sagittarius*
*Rachycentron canadum*
*Cheilodipterus lineatus*
*Nectamia savayensis*
*Ostorhinchus aureus*
*Sillago sihama*
*Echeneis naucrates*
*Remora brachyptera*
*Alectis indica*
*Atule mate*
*Carangoides armatus*
*Carangoides chrysophrys*
*Carangoides gymnostethus*
*Decapterus macarellus*
*Elagatis bipinnulata*
*Pseudocaranx dentex*
*Scomberoides commersonianus*
*Aphareus furca*
*Aphareus rutilans*
*Lutjanus argentimaculatus*
*Lutjanus bengalensis*
*Lutjanus notatus*
*Lutjanus russellii*
*Lutjanus sebae*
*Paracaesio xanthura*
*Plectorhinchus gibbosus*
*Pomadasys furcatum*
*Argyrops filamentosus*
*Rhabdosargus sarba*
*Gnathodentex aureolineatus*
*Gymnocranius grandoculis*
*Lethrinus crocineus*
*Lethrinus harak*
*Lethrinus microdon*
*Lethrinus nebulosus*
*Lethrinus variegatus*
*Lethrinus xanthochilus*
*Monotaxis grandoculis*
*Parupeneus indicus*
*Parupeneus macronemus*
*Pempheris nesogallica*
*Chaetodon auriga*
*Chaetodon blackburnii*
*Chaetodon interruptus*
*Chaetodon kleinii*
*Chaetodon madagaskariensis*
*Chaetodon vagabundus*
*Chaetodon xanthocephalus*
*Forcipiger flavissimus*
*Hemitaurichthys zoster*
*Heniochus acuminatus*
*Heniochus monoceros*
*Apolemichthys trimaculatus*
*Pomacanthus imperator*
*Cirrhitus pinnulatus*
*Cristacirrhitus punctatus*
*Abudefduf margariteus*
*Chromis atripectoralis*
*Chromis dimidiata*
*Chromis nigrura*
*Chromis ternatensis*
*Chromis viridis*
*Dascyllus aruanus*
*Plectroglyphidodon phoenixensis*
*Bodianus anthioides*
*Novaculichthys taeniourus*
*Thalassoma hebraicum*
*Calotomus carolinus*
*Hipposcarus harid*
*Helcogramma obtusirostris*
*Butis butis*
*Eleotris mauritiana*
*Ophiocara porocephala*
*Awaous commersoni*
*Sphyraena barracuda*
*Sphyraena obtusata*
*Bothus mancus*
*Bothus pantherinus*
*Pseudobalistes fuscus*
*Arothron hispidus*
*Chilomycterus reticulatus*
*Diodon liturosus*

**NT (Near threatened)**

*Squalus megalops*
*Herklotsichthys quadrimaculatus*
*Encheliophis gracilis*
*Encheliophis homei*
*Pyramodon ventralis*
*Hemiramphus far*
*Myripristis murdjan*
*Neoniphon sammara*
*Sargocentron caudimaculatum*
*Sargocentron diadema*
*Priacanthus hamrur*
*Pristigenys niphonia*
*Malacanthus brevirostris*
*Malacanthus latovittatus*
*Remora remora*
*Naucrates ductor*
*Selar crumenophthalmus*
*Seriolina rivoliana*
**Parupeneus diagonalis*
**Parupeneus posteli*
**Upeneus mascareinsis*
*Centropyge debelius*
*Pomacentrus pikei*
*Stegastes pelicieri*
*Anampses twistii*
*Parapercis punctata*
*Cirripectes randalli*
*Entomacrodus lemuria*
**Mimoblennius lineathorax*
*Callionymus aagilis*
*Acanthurus polyzona*
*Soleichthys tubifera*

**TM (Threatened migrants)**

*Isurus oxyrinchus*
*Prionace glauca*
*Sphyrna mokarran*
*Pteryplatytrygon violacea*
*Aetobatus narinari*
*Manta birostris*
*Mobula tarapacana*
*Myliobatis aquila*
*Lampris guttatus*
*Coryphaena equiselis*
*Coryphaena hippurus*
*Brama dussumieri*
*Brama orcini*
*Eumegistus illustris*
*Pteraclis velifera*
*Pterycombus petersii*
*Taractichthys steindachneri*
*Xiphias gladius*
*Istiompax indicus*
*Istiophorus platypterus*
*Kajikia audax*
*Makaira nigricans*
*Tetrapturus angustirostris*
*Masturus lanceolatus*
*Mola mola*
*Ranzania laevis*

fore, in recent years substantial works have been undertaken to collect water on the wetter windward side and transport it to the dry western side of the island, implying a significant decrease of water flow on eastern rivers.

Rivers and streams in Réunion are threatened by eutrophication and pollution in lower ranges, and especially by the construction of dams, weirs and barrages, which pollute downstream stream and river areas, abstract water from rivers which may become dry, and prevent fish migration. Gravel extraction from river beds may result in heavy sediment freight and destruction of fish spawning grounds. In several freshwater areas, extensive aquaculture projects threaten the native fish fauna by additional eutrophication, pollution, and competition/predation. Freshwater aquaculture, mainly of tilapia (*Oreochromis niloticus*) and trout (*Oncorhynchus mykiss*), was estimated in 2005 at 120 tonnes (Anonymus 2006b). In addition, there is a fishing pressure in some freshwater habitats, especially on migrating goby larvae (e. g. 'bichique' *Sicyopterus lagocephalus*).

The Red List status of the fishes of Réunion is summarised in Tab. 6. At present, a total of 968 native fish species is known from La Réunion. Out of these species, a total of 378 species is listed on the Red List (39.2 % of the native species), with no species globally extinct (as far as known), 18 species regionally extinct (1.9 %), 27 species critically endangered (2.8 %), 115 species endangered (11.9 %), 160 species vulnerable (16.6 %), 32 species near threatened (3.3 %), and 26 species threatened migrants (2.7 %). An additional 575 species are data deficient (59.4 %). 16 species have been introduced and are thus not native; they were not evaluated for the Red List. This means that only the remaining 10 species of fishes in Réunion are not threatened.

Out of the total of 965 species of fishes at Réunion, 290 have a high priority requiring immediate political action (30.0 %), mainly species of the coral reef and of freshwater habitats; 489 species have a medium priority (50.5 %), 173 species a low priority not needing immediate action (17.9 %), and 16 introduced species were not evaluated (1.6 %).

La Réunion, as an overseas region in the European Union, is at present not represented by habitats or species on the Annexes of the EU Habitats Directive. Considering the highly diverse fish fauna with a high degree of endemism, a list of species suitable for the annexes is proposed in Tab. 7; this set of species would be scientifically adequate covering all important watersheds and habitats, and would be sufficient for the fulfilment of the Directive, in order to treat Réunion equally to other EU regions.

Though in recent years substantial efforts have been undertaken by the authorities to establish marine reserves and protected areas, the conservation of fish fauna and aquatic habitats requires special attention in Réunion. As the distribution and even the fish species composition is still far from well-known, it is strongly recommended to establish a programme for the monitoring and mapping of the fish fauna and environmental quality of aquatic habitats. General recommendations for the management and conservation of marine, transitional and freshwater habitats of Réunion would include the following items:

1) Improving sewage treatment facilities in Réunion and neighbouring island states;

2) It is proposed to establish a set of conservation areas

**Tab. 7.** Fish species proposed for Annexes II, IV and/or V of the EU Habitats Directive.

| Species | Proposed for Annexes of EU Habitats Directive |
|---|---|
| *Abudefduf margariteus* | II, IV |
| *Acanthocybium solandri* | V |
| *Agonostomus telfairii* | II, V |
| *Aphareus furca* | II |
| *Aphareus rutilans* | II |
| *Apolemichthys guezei* | II, IV |
| *Auxis rochei* | V |
| *Awaous commersoni* | II, IV |
| *Carcharodon carcharias* | II, IV prioritary species |
| *Chaetodon guttatissimus* | II, IV |
| *Chaetodon melannotus* | II, IV |
| *Chaetodon trifascialis* | II, IV |
| *Cheilinus oxycephalus* | II |
| *Cotylopus acutipinnis* | II |
| *Dascyllus carneus* | II, IV |
| *Eleotris mauritiana* | II |
| *Entomacrodus lemuria* | II |
| *Euthynnus affinis* | V |
| *Gobiodon citrinus* | II |
| *Gobiodon rivulatus* | II |
| *Hippocampus* spp. | II, IV prioritary species |
| *Kuhlia caudavittata* | II, V |
| *Paracaesio xanthura* | II, V |
| *Paragobiodon echinocephalus* | II |
| *Paragobiodon modestus* | II |
| *Periophthalmus kalolo* | II |
| *Plectroglyphidodon dickii* | II, IV |
| *Pomacentrus pikei* | II |
| *Pomadasys furcatum* | II, V |
| *Remora australis* | II, IV |
| *Remora brachyptera* | II, IV |
| *Sarda orientalis* | V |
| *Sardinella jussieu* | II, V |
| *Scomberomorus commerson* | V |
| *Squalus megalops* | II, V |
| *Stenogobius polyzona* | II |
| *Strophidon sathete* | II, V |
| *Thalassoma hardwicke* | II |
| *Thunnus alalunga* | V |
| *Thunnus albacares* | V |
| *Thunnus obesus* | V |

for fish species and aquatic habitats in a set of rivers and streams, as well as in additional marine areas including the rocky coast, sand bottom habitats and estuaries. Sites should be established at least for the species listed on Annexes II and IV of the EU Habitats Directive, and for the species proposed in the present paper (Tab. 7). For areas where migratory species occur but do not permanently live, sites as stepping stones (resting areas for adult upstream and juvenile downstream migration) according to the present usage in the EU member states should be established.

3) In order to assist successful conservation programmes for fishes and their habitats in Réunion, environmental education of the public (regarding water cycle, saving water, importance of healthy aquatic environments, impact of fisheries, threats and conservation) should be intensified.

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# *Callionymus aagilis* Fricke, redescription and new record from Mauritius (Teleostei: Callionymidae)

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Abstract

The rare dragonet *Callionymus aagilis* Fricke, 1999, is redescribed on the basis of a female specimen from Mauritius, Mascarene Islands. Female characters, sexual dimorphism, and habitat of the species are described and discussed. *Callionymus aagilis* is compared with related species. A key to callionymid fish species of the western Indian Ocean and the Red Sea is presented.

Keywords: Fishes, Dragonets, Callionymidae, Mascarene Islands, Mauritius, new record, redescription, identification key.

Zusammenfassung

Die seltene Leierfischart *Callionymus aagilis* Fricke, 1999 wird auf der Grundlage eines weiblichen Exemplars von den Maskarenen (Mauritius) wieder beschrieben. Insbesondere werden weibliche Merkmale, Sexualdimorphismus und das Habitat der Art beschrieben und diskutiert. *Callionymus aagilis* wird mit verwandten Arten verglichen. Ein Bestimmungsschlüssel der Callionymidae des westlichen Indischen Ozeans und des Roten Meeres wird aufgestellt.

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## 1 Introduction

Dragonets of the family Callionymidae are a group of benthic living fishes occurring in the upper 900 metres of all temperate, subtropical and tropical oceans of the world, and a few species found in estuarine and freshwater habitats. The Indo-Pacific species were revised by Fricke (1983a), who distinguished 126 valid species from the area, including three species from the Mascarenes. Fricke (2002), in a checklist of the callionymid fishes of the world, listed a total of 182 valid species in 10 genera. Subsequently, three additional species (*Callionymus kanakorum* and *Protogrammus antipodum* from New Caledonia, *Tonlesapia tsukawakii* from Cambodia) were described by Fricke (2006) and Motomura & Mukai (2006), and *Eleutherochir mccaddeni* Fowler, 1941 was removed from the synonymy of *E. opercularis* by Yoshigou et al. (2006), bringing the worldwide total to 186 species in the family.

Fricke (1999) provided a checklist of Mascarene fishes. He distinguished a total of four callionymid fish species, and described *Callionymus aagilis* Fricke, 1999, on the basis of a single male specimen from La Réunion.

A second specimen of this extremely rare species was recently discovered in the collection of the BMNH. It turned out to be the first female recorded, and the first record of the species from Mauritius. The species is redescribed in the present paper.

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## 2 Methods and Materials

Methods follow Fricke (1983a); fin-ray counts follow Fricke (1983b). The starting point for length measurements is the mid of the upper lip. The predorsal (1) length is measured from the mid of the upper lip to the base of the first spine of the first dorsal fin; the predorsal (2) length correspondingly to the base of the first ray of the second dorsal fin. The last ray of the second dorsal and anal fins is always divided at its base; counts in the key include this divided ray as one. Data for the holotype are given first, followed by data for the second specimen, in parentheses.

Species are classified based on Fricke (2002). In an alternative classification by Nakabo (1982), *Callionymus aagilis* would be a member of the genus *Calliurichthys*.

Materials used for this paper are deposited in The Natural History Museum, London (BMNH), and in the Muséum National d'Histoire Naturelle, Paris (MNHN).

## 3 Taxonomy

*Callionymus aagilis* Fricke, 1999
(Figs. 1–2)

*Callionymus persicus* (non Regan, 1908): Fricke 1983a: 417 (Réunion).
*Callionymus aagilis* Fricke, 1999: Fricke 1999: 491–493, fig. 9 (Réunion; holotype: MNHN 1966-0833). Fricke 2002: 10 (Réunion).
*Callionymus angilis*: Letourneur et al. 2004: 214 (Réunion; in checklist; spelling error).

Holotype. La Réunion: MNHN 1966-0833, 1 male, 106.6 mm SL, coll. P. Guézé.

Other material. Mauritius: BMNH 2002.6.30.1302, 1 female, 12.5 mm SL, west coast, Baie de la Petite Rivière, 20°12'30"S 57°23'20"E, sand adjacent to coral heads and rocks, 30 m depth, P.C. Heemstra et al., St. PCH95-M36, 26 May 1995.

### Diagnosis

A *Callionymus* of the *Callionymus persicus*-group with 9 rays in the second dorsal fin, 8 rays in the anal fin, a strong antrorse spine at the base and 3–6 small antrorse serrae on the dorsal margin of the preopercular spine, the middle 4 rays of the caudal fin extremely elongate in the male, caudal fin only slightly elongate in the female, the male's throat with a black blotch surrounded by wavy lines which reach onto the membrane connecting the fifth ray of the pelvic fin with the pectoral fin base, throat in the female with several dusky pigment spots, the first dorsal fin grey, with narrow pale lines in the male, plain blackish in the female, first spine in the male with a long filament, in the female without elongate filaments.

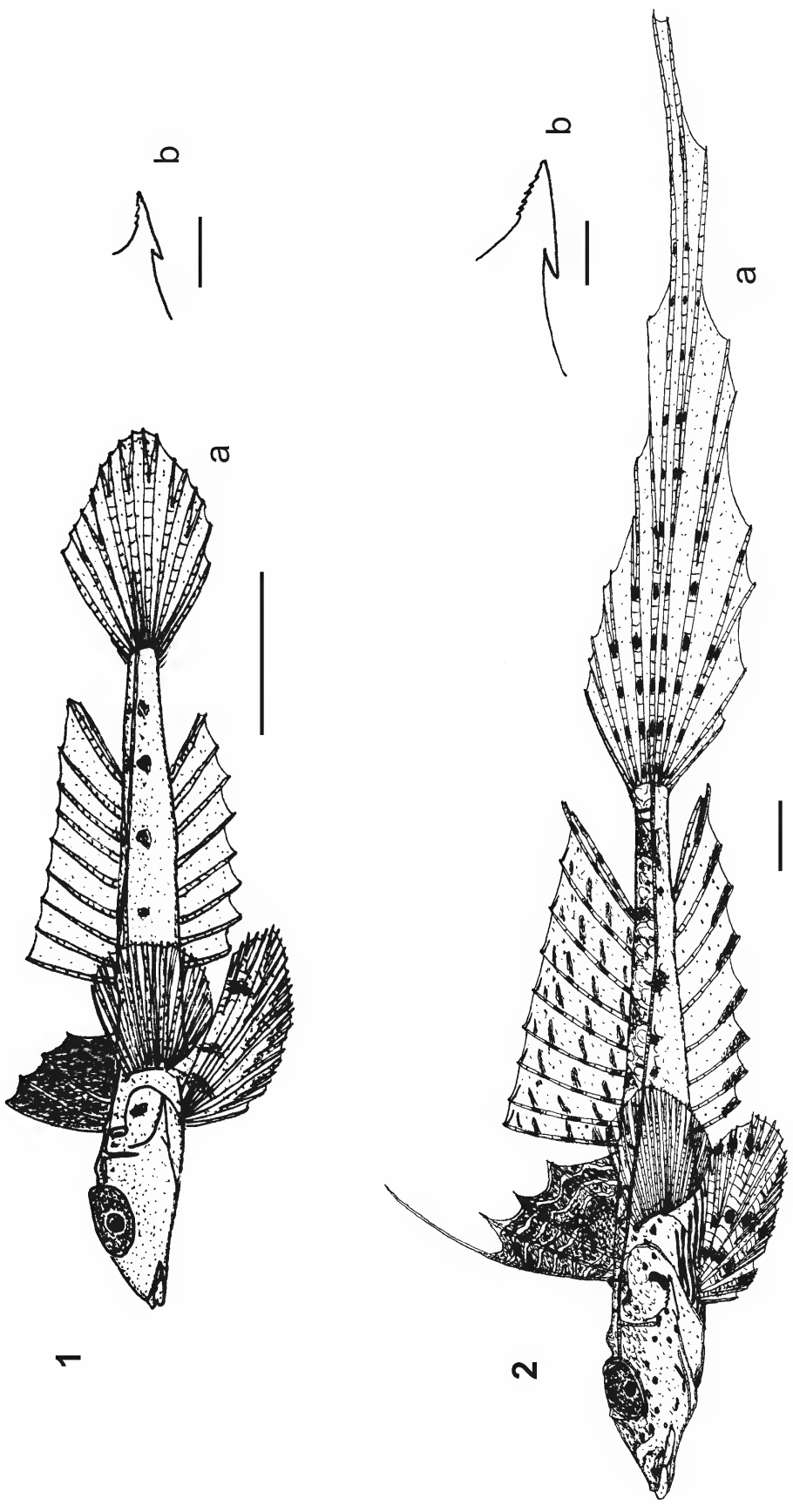
### Redescription

D IV + viii,1; A vii,1; $P_1$ ii,16,iii (total 21) (ii,15,iii, total 20); $P_2$ I,5; C (iii),i,7,ii,(iii) [(ii),i,7,ii,(ii)].

Body elongate and slightly depressed. Head slightly depressed, triangular when seen from above, 3.8 (3.2) in SL. Eye 2.9 (2.6) in head. Preorbital length in male 2.4 in head, in female 3.8 in head. Interorbital distance 23.4 (11.0) in head. Upper jaw length 2.6 (2.4) in head. Preopercular spine with straight main tip, straight, smooth ventral margin, strong antrorse spine at base, and 5–6 (3–4) small antrorse serrae on dorsal margin, no points on ventral margin or base, formula 1 $\frac{5-6}{}$ 1 (1 $\frac{3-4}{}$ 1). Cephalic lateral-line system with preorbital branch, suborbital branch, short preopercular branch, separate mandibular branch, and supraoccipital commissure connecting lines of opposite sides. Occipital region with two strong bony protuberances, and one small protuberance posteriorly in between. Body depth 10.2 (9.6) in SL. Body width 5.8 (5.2) in SL. Body lateral-line system with 6–10 short dorsal branches, and two commissures dorsally on caudal peduncle connecting lateral lines of opposite sides; lateral line reaching onto caudal peduncle a short way along the fourth branched ray for about a quarter of its length. Urogenital papilla length 14 in head in male holotype (not visible in female). Caudal peduncle length 6.2 (5.9) in SL. Caudal peduncle depth 21 (31) in SL.

First dorsal fin relatively high in male, only first spine in male with long filament; length of first spine in male 2.2 in SL, second spine 4.7 in SL, third spine 5.9 in SL, fourth spine 7.9 in SL. First dorsal fin lower in female, without filaments; first spine in female 5.9 in SL, second spine 6.5 in SL, third spine 7.0 in SL, fourth spine 9.0 in SL. Predorsal (1) length 3.3 (3.7) in SL. Second dorsal fin distally straight, last ray slightly elongate in male. First ray of second dorsal fin in male 6.1 in SL, fifth ray 6.3 in SL, last ray 5.2 in SL; first ray in female 7.4 in SL, fifth ray 7.8 in SL, last ray 7.8 in SL. Predorsal (2) length 2.0 (2.1) in SL. Anal fin beginning on vertical through first membrane of second dorsal fin. Anal fin rays unbranched, last divided at base. First ray of anal fin 12.1 (13.9) in SL, fifth ray 7.6 (9.5), last ray 6.0 (7.8) in SL. Preanal fin length 1.9 (1.9) in SL. Pectoral fin reaching to base of third anal fin ray when adpressed, pectoral fin length 5.6 (4.0) in SL. Prepectoral fin length 2.5 (2.9) in SL. Pelvic fin reaching to base of second (third) anal fin ray when adpressed; pelvic fin spine 19.4 (9.5) in SL, pelvic fin length 3.6 (3.0) in SL. Membrane connecting fifth pelvic fin ray with pectoral fin base ending opposite ninth pectoral fin ray (counted from above). Prepelvic fin length 3.6 (3.9) in SL. Caudal fin in male with median four rays distally extremely elongate, only slightly elongate in female; caudal fin length in male 0.9 in SL, in female 3.0 in SL.

Colour in alcohol. Head and body light brown, ventrally white; dorsal half dark brown, sides of head in the male with small dark grey blotches. Snout in the male dorsolaterally with a curved whitish band. Eye dark grey. Opercle with a dark brown blotch above the preopercular spine. Throat of male with a large triangular black blotch surrounded by wavy white lines, in female with few dark pigment spots. Sides of body with a row of dark brown blotches below the lateral line. Back with a number of indistinct dark brown saddles corresponding with the lateral blotches, and numerous small whitish and brownish blotches (colouration less distinct in female than in male). First dorsal fin in the male dark grey with several narrow, wavy white lines. Tip of third spine with a small black blotch. Filament of first spine yellowish. First dorsal fin plain black in female. Second dorsal fin translucent, in male with small oblique blackish streak near the distal tip of each ray; each ray also with 3–4 brown spots, followed by a brownish grey oblique streak. Anal fin translucent, tip of each ray dark grey in male. Caudal fin pale, anterior three-fourths in male with 11 median, vertical dark brown lines formed by dark brown spots on the fin rays. Pelvic fin whitish, with three rows of dark brown blotches. Pectoral fin whitish.




**Figs. 1–2.** *Callionymus aagilis*, lateral view (a), left preopercular spine (b). – **1**. BMNH 2002.6.30.1302, female, 12.5 mm SL. **2**. MNHN 1966-0833, male, holotype, 106.6 mm SL, La Réunion (from FRICKE 1999: fig. 9). – Scales: 10 mm (2a), 3 mm (1a, 2b), 1 mm (1b).

Sexual dimorphism. The male differs from the female in having a higher first dorsal fin with the first spine filamentous (without filaments in the female), a slightly higher second dorsal fin, a much longer caudal fin, and a dark blotch surrounded by wavy lines on the throat.

## Distribution

The male holotype was known from La Réunion, Mascarene Islands, western Indian Ocean; the female specimen was recently collected at Mauritius, also Mascarene Islands. This is a new record for Mauritius. The species is probably endemic to the western Mascarenes.

## Habitat

The Mauritius specimen was collected with rotenone on a sand bottom adjacent to rocks and coral heads, at a depth of 30 m. Larger specimens of the species may occur deeper.

The habitat of the La Réunion holotype is not known. However, deeper sand bottoms only occur off northwestern La Réunion in Le Port area, so it can be assumed that the fish was collected there.

In general, this species is expected to occur on soft bottoms on the upper insular slope of the western Mascarenes. As this habitat is very scarce, and as *Callionymus aagilis* is expected to have a patchy distribution pattern like most of its congeners, with a group of fishes (harem system) living in a home range of a few square metres while the remaining sand bottom is uninhabited, this species is expected to be very rare. Rarity, however, is frequently observed in tropical marine fish species, and is only partly due to low collecting effort in appropriate habitats. It may be a strategy used to reduce or avoid parasite infections, as parasite species usually specialise on common species as hosts.

## Affinities

The new specimen of *Callionymus aagilis* (BMNH 2002.6.30.1302) shows typical female characters including a low first dorsal fin without filaments, the urogenital papilla lacking, and a short caudal fin. It agrees with the male specimen of *C. aagilis* in the shape of the preopercular spine and the body colouration (including a series of black blotches along the sides of the body). Both the male and the female specimens of that species share typical characters of the genus *Callionymus* [unnamed subgenus 6 of Fricke (2002), former *Callionymus persicus* species-group; a detailed paper on the classification of callionymid fishes is in preparation by the author], according to Fricke (2002: 100–101). Subgenus 6 is characterised by a combination of 9 rays in the second dorsal fin, 8 rays in the anal fin, very small antrorse serrae dorsally on the preopercular spine, and only the median caudal fin rays elongate in the male, while the caudal fin is only slightly elongate in the female. Other species of this group are *Callionymus izuensis* Fricke & Zaiser Brownell, 1993 (Fricke & Zaiser Brownell 1993: 4–7, fig. 2; Miyake-jima, Japan), *Callionymus luridus* Fricke, 1981 (Fricke 1981: 390–393, figs. 2–3; Macclesfield Bank, South China Sea), *Callionymus neptunius* (Seale, 1910) (Seale 1910: 539–540; Balayan Bay, Philippines, *Calliurichthys neptunia*), *Callionymus persicus* Regan, 1905 (Regan 1905: 325–326, pl. 3, fig. 1; Persian Gulf; Mekran coast/Iran; Muscat/Oman), *Callionymus sereti* Fricke, 1998 (Fricke 1998: 6–9, fig. 2; Futuna Island Shelf, Wallis and Futuna), *Callionymus superbus* Fricke, 1983 (Fricke 1983a: 442–448, fig. 131; Indonesia), *Callionymus tethys* Fricke, 1993 (Fricke 1993: 369–371, fig. 2; SSE of Nouméa, Grande Terre, New Caledonia), and *Callionymus zythros* Fricke, 2000 (Fricke 2000: 62–66, fig. 30; Papua New Guinea, Madang).

*Callionymus aagilis* is distinguished from other species of subgenus 6 by several characters:

– first dorsal fin of the male grey, with few oblique wavy white lines (*C. izuensis* light, with many narrow angular black streak and an elongate black spot distally on second membrane; *C. luridus* pale grey, with large white blotches and a large black blotch dorsally on the third spine; *C. neptunius* light, with irregular vertical dark lines and blotches; *C. persicus* dark brown, with many oblique whitish lines; *C. sereti* light, with a few narrow dusky streaks, and a dark spot distally on the third spine; *C. superbus* brown, distally with broad irregular whitish streaks; *C. tethys* male whitish, with numerous thin oblique dark stripes and a dark spot distally on second membrane; *C. zythros* pale, on first and second membranes of spinous dorsal fin with 8 narrow oblique brown lines, and on third and fourth membranes with irregular brown blotches and lines);

– only the first spine of the first dorsal fin of the male with a long filament (*C. izuensis* without filaments; *C. luridus* with a short filament on the first spine only; *C. neptunius* with long filaments on the first to third spines; C. persicus without filaments at all; *C. superbus* with long filaments on the first to third spines; *C. tethys* with the first to third spines filamentous, filaments on second and third spines longest; *C. zythros* without filaments at all);

– anal fin of the male translucent, with only the tip of each ray dark grey, without any markings in the female (*C. izuensis* with a broad distal blackish band in both sexes; *C. luridus* with a narrow distal dark streak; *C. neptunius* with a broad submarginal dark streak across the fin; *C. persicus* with a broad submarginal dark streak across the fin in both sexes; *C. superbus* with distal three-fourths black, only tips of fin rays white; *C. tethys* with a broad submarginal dark band in both sexes; *C. zythros* with distal half of fin brown, leaving tips of fin rays whitish);

– 3–6 antrorse serrae on the dorsal margin of the preo-

percular spine (*C. sereti* 6–8, *C. superbus* 8–10, and *C. tethys* 5–9).

A revised key to callionymid fish species of the Red Sea and western Indian Ocean is presented below to distinguish *Callionymus aagilis* from potentially co-occurring species.

**4 Key to species of Callionymidae of the Red Sea and western Indian Ocean**

**1** Opercle with a free flap of skin. . . . . **2**
– Opercle without a free flap of skin. . . . . **7**
**2** Body with lateral fold of skin below LL; lower lip without fleshy papillae; A rays unbranched. . . . . (*Diplogrammus*) **3**
– Body without lateral fold of skin below LL; dorsal margin of lower lip with a row of erect fleshy papillae; A rays branched. . . . . (*Draculo*) **6**
**3** Second spine of first dorsal fin longer than first spine of second dorsal fin. . . . . **4**
– Second spine of first dorsal fin as long as or shorter than first spine of second dorsal fin. . . . . **5**
**4** Body depth 12–13 % of standard length; pectoral fin rays 1. . . . . ***Diplogrammus gruveli*** Smith, 1963
– Body depth 17–18 % of standard length; pectoral fin rays 20. . . . . ***Diplogrammus pygmaeus*** Fricke, 1981
**5** First spine of first dorsal fin with long filament in male; main tip of preopercular spine upcurved; anal fin without distal black margin. . ***Diplogrammus infulatus*** Smith, 1963
– First spine of first dorsal fin without filament in male; main tip of preopercular spine straight; anal fin with narrow distal black margin. . . . . ***Diplogrammus randalli*** Fricke, 1983
**6** First dorsal fin with a single spine; second dorsal fin with 11 rays (the last divided at its base); anal fin with 12 branched rays (the last divided at its base). . . . . ***Draculo celetus*** (Smith, 1963)
– First dorsal fin with 4 spines; second dorsal fin with 9–10 rays (the last divided at its base); anal fin with 10 branched rays (the last divided at its base). . . . . ***Draculo maugei*** (Smith, 1966)
**7** Lateral line with numerous long branches above and below; preopercular spine simple, without accessory spines. . . . . ***Paracallionymus costatus*** (Boulenger, 1898)
– Lateral line mostly unbranched; preopercular spine with one or more accessory spines. . . . . **8**
**8** Snout shorter than eye diameter; soft D rays branched (in specimens longer than 3 cm); gill opening sublateral; no antrorse spine present at preopercular spine base. . . . . (*Synchiropus*) **9**
– Snout equal to, or longer than, eye diameter; soft D rays unbranched; gill opening dorsal; antrorse spine at base of preopercular spine. . . . . (*Callionymus*) **14**
**9** Preopercular spine with 1 dorsal point additional to main tip. . . . . **10**
– Preopercular spine with 2–5 dorsal points additional to main tip. . . . . **11**
**10** Caudal fin pale or with 1 distal dark bar; caudal fin length 33–40 % of standard length; second dorsal fin pale or with distal dark bar. . . . ***Synchiropus monacanthus*** Smith, 1935
– Caudal fin with 2 dark bars; caudal fin length 27–32 % of standard length; second dorsal fin spotted. . . . . ***Synchiropus stellatus*** Smith, 1963
**11** Preopercular spine with 2 dorsal points additional to main tip. . . . . **12**
– Preopercular spine with 3–5 dorsal points additional to main tip. . . . . **13**
**12** Main tip of preopercular spine straight; preopercular spine always without small antrorse spines at base; first dorsal fin dark, striped. . . . . ***Synchiropus marmoratus*** (Peters, 1855)
– Main tip of preopercular spine upcurved; preopercular spine usually with 1–2 small antrorse points at base; first dorsal fin light, with dark blotches. . . . . ***Synchiropus sechellensis*** Regan, 1908
**13** Dorsal spines filamentous in male; lower pectoral fin base without black spots. . . . ***Synchiropus postulus*** Smith, 1963
– Dorsal spines not filamentous in male; lower pectoral fin base with black spot. . ***Synchiropus minutulus*** Fricke, 1981
**14** Both dorsal and ventral margins of preopercular spine with antrorse spines or serrae. . . . . **15**
– Only dorsal margin of preopercular spine with curved points or antrorse serrae (1–2 antrorse spines may be present at base of preopercular spine). . . . . **17**
**15** Snout densely covered with numerous spines. . . . . ***Callionymus spiniceps*** Regan, 1908
– Snout without spines (occasionally except for a small preorbital spine). . . . . **16**
**16** Overeye tentacle present; lower margin of preopercular spine with 1–3 curved points additional to antrorse spine at base. . . . . ***Callionymus muscatensis*** Regan, 1905
– Overeye tentacle absent; lower margin of preopercular spine with 4–9 curved points additional to antrorse spine at base. . . . . ***Callionymus oxycephalus*** Fricke, 1980
**17** Upper margin of preopercular spine with small antrorse serrae. . . . . **18**
– Upper margin of preopercular spine with large curved points (occasionally with one additional antrorse serra). . . . . **27**
**18** Second dorsal fin with 8 rays (the last divided at its base). . . . . **19**
– Second dorsal fin with 9 rays (the last divided at its base). . . . . **22**
**19** Anal fin with 7 rays (the last divided at base). . . . . **20**
– Anal fin with 8 rays (the last divided at base). . . . . **21**
**20** Main tip of preopercular spine upcurved; dorsal margin of preopercular spine with 5–6 small antrorse serrae. . . . . ***Callionymus flavus*** Fricke, 1983
– Main tip of preopercular spine straight; dorsal margin of preopercular spine with 8–15 small antrorse serrae. . . . . ***Callionymus delicatulus*** Smith, 1963
**21** First spine of first dorsal fin filamentous; anal fin distally black. . . . . ***Callionymus margaretae*** Regan, 1905
– First dorsal fin without filaments; anal fin pale. . . . . ***Callionymus tenuis*** Fricke, 1981
**22** Anal fin with 9 rays (the last divided at its base); first spine of first dorsal fin in male separate from second spine. . . . . ***Callionymus filamentosus*** Valenciennes in Cuvier & Valenciennes, 1837
– Anal fin with 8 rays (the last divided at its base); first spine of first dorsal fin in male connected with second spine. . . **23**
**23** First spine of first dorsal fin with a long filament. . . . . **24**
– First spine of first dorsal fin without a filament. . . . . **26**
**24** Lower margin of caudal fin pale. . . . . ***Callionymus aagilis*** Fricke, 1999
– Lower margin of caudal fin black. . . . . **25**
**25** Third spine of first dorsal fin distally with black blotch; dorsal margin of preopercular spine with 6–12 small antrorse serrae. . . . ***Callionymus gardineri*** Regan, 1908, male
– Third spine of first dorsal fin without distal black blotch; dorsal margin of preopercular spine with 3–6 small antrorse serrae. . . . . ***Callionymus margaretae*** Regan, 1905
**26** Anal fin with a distal black bar. . . . . ***Callionymus persicus*** Regan, 1905
– Anal fin pale. . . . . ***Callionymus gardineri*** Regan, 1908, female

**27** First dorsal fin with 3 spines; jaws extremely protractile, forming a broad tube when protracted. . . . . ***Callionymus hindsii*** Richardson, 1844
– First dorsal fin with 4 spines; jaws moderately protractile, narrow when protracted. . . . . **28**
**28** Anal fin with 7 rays (the last divided at base). . . . . ***Callionymus stigmatopareius*** Fricke, 1981
– Anal fin with 8 or 9 rays (the last divided at base). . . . . **29**
**29** Upper margin of preopercular spine with a small antrorse barb near main tip, and with 1–2 large curved points. . . . **30**
– Upper margin of preopercular spine without a small antrorse barb near main tip, but with one or more large curved points. . . . . **34**
**30** Caudal fin distally convex or slightly pointed, with 1–2 filaments. . . . . **31**
– Caudal fin distally convex, without filaments. . . . . **32**
**31** Second dorsal fin with vertical black streaks. . . . . ***Callionymus bentuviai*** Fricke, 1981
– Second dorsal fin with horizontal rows with white and/or dark blotches. . . . . ***Callionymus africanus*** (Kotthaus, 1977), male
**32** Black blotch on first dorsal fin on first or second to third membranes; cheeks pale. . . . . ***Callionymus kotthausi*** Fricke, 1981
– Black blotch on first dorsal fin only on third membrane; cheeks with spots or suborbital dark streak. . . . . **33**
**33** Suborbital dark streak present; second half of anal fin black. . . . ***Callionymus africanus*** (Kotthaus, 1977), female
– No suborbital dark streak, but many brown blotches encircled with darker brown on cheeks; anal fin pale, distal margin dusky. . . . . ***Callionymus regani*** Nakabo, 1979
**34** Dorsal margin of preopercular spine with 1–2 curved points. . . . . **35**
– Dorsal margin of preopercular spine with 3–7 curved points. . . . . **36**
**35** Main tip of preopercular spine long, curved; preopercular spine not upcurved at base. . . . . ***Callionymus carebares*** Alcock, 1890
– Main tip of preopercular spine short, straight; preopercular spine upcurved at base. . . . . ***Callionymus mascarenus*** Fricke, 1983
**36** Caudal fin elongate, with 2 long median filaments. . . . . ***Callionymus cooperi*** Regan, 1908
– Caudal fin distally convex, without filaments. . . . . **37**
**37** Second spine of first dorsal fin longer than first (may both be filamentous in males). . . . . ***Callionymus erythraeus*** Ninni, 1934
– Second spine of first dorsal fin shorter than first. . . . . **38**
**38** Preopercular spine strongly upcurved at base; male with black blotch surrounded by white posteriorly on first dorsal fin. . . . . ***Callionymus mascarenus*** Fricke, 1983
– Preopercular spine only slightly upcurved at base; male without black blotch posteriorly on first dorsal fin. . . . . ***Callionymus marleyi*** Regan, 1919

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# New larvae of Caeninae from Madagascar (Ephemeroptera: Caenidae)

Peter Malzacher

Abstract

Larvae of four different species of *Caenis* and one of *Callistinella* from Madagascar are described. Furthermore, a description of a new Malagasy genus and species, *Trichocaenis inexperta* **n. gen., n. sp.**, is provided, based on larval characters. Characters of subimaginal genitalia of larvae of two species of *Caenis* allow a preliminary assignment to *C. spinosa* and *C. johannae*. The studied material of *Callistinella* is very similar to the *Caenis rutila*-group.

K e y w o r d s : Madagascar, Caenid larvae, new genus, new species, *Caenis*, *Trichocaenis*, *Callistinella*.

Zusammenfassung

Vier verschiedene Larvenformen der Gattung *Caenis* sowie eine der Gattung *Callistinella* von Madagaskar werden beschrieben. Außerdem wird aufgrund von Larvenmerkmalen eine für die Wissenschaft neue madagassische Gattung und Art, *Trichocaenis inexperta* **n. gen., n. sp.**, beschrieben. Merkmale der subimaginalen Genitalien von zwei Arten von *Caenis* ermöglichen eine vorläufige Zuordnung zu *C. spinosa* und *C. johannae*. Das studierte Material von *Callistinella* ist der *Caenis rutila*-Gruppe sehr ähnlich.

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## 1 Introduction

Demoulin (1973) was the first who mentioned a Caenidae larva from Madagascar, determined by him as *Austrocaenis* sp. Malzacher (1995) described five species of the genus *Caenis* and one of the new genus *Madecocercus* from Madagascar, but all were based on imaginal material only. While the larvae of *Madecocercus* were further treated by McCafferty & Wang (1995), Elouard & Sartori (2001) and Malzacher & Staniczek (2006), the larvae of the Malagasy *Caenis* remained unknown. When Sun & McCafferty (2002) described an additional genus, *Callistina* (because of homonymy renamed to *Callistinella* by Sun & McCafferty 2004), based on larval material only, the authors conceded the possibility that the new larva could prove to be the unknown aquatic stage of one of the Malagasy *Caenis* species already described. This becomes very likely by the results of this investigation.

Four different larval forms of *Caenis* and one of *Callistinella* are described in the present paper, and are – in part – preliminary assigned to taxa already known from described males (*Caenis spinosa* Malzacher, 1995 and *C. johannae* Malzacher, 1995). Furthermore a new genus and species, *Trichocaenis inexperta* n. gen., n. sp., is described, based on larval characters. However, a correct assignment of the treated larval forms to known species can only be confirmed when males are reared from larvae.

Acknowledgements

My special thanks go to Michel Sartori (Musée Cantonal de Zoologie, Lausanne) for leaving me the material for investigation. Thanks are also due to Arnold Staniczek and Susanne Leidenroth (Staatliches Museum für Naturkunde, Stuttgart) for help and making the SEMs. Michel Sartori and Arnold Staniczek kindly read the manuscript.

## 2 Material and methods

The extensive material of Malagasy Caenidae adults collected in the 1990s by the ORSTOM-team of Dr. Jean-Marc Elouard, which I received from Dr. Michel Sartori (Lausanne) also contained 35 samples with a total of 61 larvae stored in 75 % ethanol. Besides numerous larvae of *Caenis*, the material consists of two specimens of the new genus *Trichocaenis*, one specimen of *Callistinella*, two samples with *Clypeocaenis afrosetosa* Soldán, 1978 from Guinea and Côte d'Ivoire and one larva of

*Barnardara demoori* from the Democratic Republic of Congo. Additionally two larvae of *Clypeocaenis oligosetosa* Soldán, 1983 (coll. SOLDÁN) were examined, as well as four samples with *Callistinella* larvae from the Montagne d'Ambre in the North of Madagascar, collected by REINHARD GERECKE and TOM GOLDSCHMIDT, two specialists of water mites.

The studied material is hosted in the Museum of Zoology Lausanne, except of a few duplicate specimens of the ORSTOM-material and the two specimens of *Clypeocaenis oligosetosa* which are stored in my collection.

Specimens used for SEM were dehydrated through a stepwise immersion in ethanol and then dried by critical point drying. The mounted material was coated with a 20 nm Au/Pd layer, and examined with an ISI-SS40 scanning electron microscope at 10 kV, and digital photographs were subsequently aquired by using DISS 5 (point electronic).

## 3 Systematic account

### 3.1 Genus *Caenis* Stephens, 1835

Larvae of the genus *Caenis* can be characterised and distinguished from all other genera of Caenidae by the following combination of characters:

Thorax not broadened. Head neither with ocellar tubercles nor with ridges and microscopic pits. Clypeus not protruding anteriorly. Maxillar and labial palps three-segmented. Basal segment of labial palp longer than broad. Fore tibia and fore tarsus without very long bristles. Femora distinctly longer than broad and distinctly broader than tibiae, without extended plates. Operculate gill ventrally with a very regular row of scale-shaped microtrichia reaching hind margin of the gill. A great number of filaments of gills III–V(VI) with 3–4(5) branches. Lateral spines of abdomen not bent dorsally. Posterior part of sternum IX with shagreen field dorsally (Fig. 2c). Abdominal terga VII–IX without mediolongitudinal ridge. Hind margin of sternum IX without a bi-pointed process with concave margin between the points.

#### *Caenis* sp. *spinosa*-group (larvae) (Fig. 1)

##### Material

1 larva: P0047, Madagascar, Betsiboka, Andranolave, Andakana, 18.IV.1991. – 1 larva: P0299, Madagascar, Sahankazo, Antsahamaiky, Joffreville, 12°30'00"S, 49°24'00"E, 28.III.1995. – 4 larvae (1 ♂ larva with SI-genitalia): P0652, Madagascar, Namorona, Tsaratango, 21°16'20"S, 47°31'35"E, 13.XI.1996. – 1 larva: P0868, Madagascar, PK 13 route Anosibe an'ala, 19°03'00"S, 48°13'57"E, 11.IV.1999. – 1 larva (♂ larva with SI-genitalia): P1008, Madagascar, Lokoho, Manantenina, Marojejy camp 1, 14°24'43"S, 49°46'48"E, 25.XI.1999.

##### Description

Measurements: ♂ larva of last instar: Body length 3.7–4.0 mm; length of cerci 1.7 mm; length of paracercus 2.0 mm. – ♀ larva of last instar: Body length 4.5–4.7 mm; length of cerci 3.0 mm; length of paracercus 3.5 mm.

Colouration of chitinous layers: Redish-yellowish-brown. Genae, lateral margins of pronotum, operculate gills, and posterolateral parts of abdominal terga lightened, also a round spot anterior to the frontal ocellus, a median longitudinal dash on vertex, a round spot on each side of pronotum and 4–5 spots or dashes on each mesonotum half. Pale spots are also present on second abdominal tergum in front of the insertion of operculate gills. Antennae, legs and terminal filaments pale yellow.

Epidermal pigmentation: Weak and diffuse on pronotum, metanotum and abdominal terga.

Head: Genae slightly bulged. Proximal comb of epipharynx of medium length, consisting of stout, slightly curved, apically blunt setae, the proximal ones pinnate. Mandibles laterally with bristles distally shortened and broadened. Dorsal surface densely tuberculate. Aboral side of postmentum laterodorsally without setae. Third segment of labial palp very short, second segment about 2.7 times as long as third segment (measured along the longitudinal centre line).

Thorax: Sides of pronotum broadly flattened, anteriorly diverging and bowed, margins notched. Side of mesonotum in its anterior part with a more or less hooked process (Fig. 1k). Coxal processes semicircular or tongue-shaped, with strong denticles (Fig. 1l, 1m). Transverse row of bristles on fore femur dense and straight (Fig. 1i); bristles of the row short and very broad, apically not pinnate (Fig. 1j). Similar bristles on dorsal surface and hind margins of mid and hind femora. Fore tarsus with a row of 5–6 long simple bristles. Mid tarsus with a row of 7–8 strong simple bristles, the two apical ones pinnate. Hind tarsus with an inner row of 9(–10) strong, simple bristles and an outer row of about 6 bipinnate bristles. Fore claws slightly curved (Fig. 1n). Mid and hind claws apically strongly bent, mid claws with about 8 denticles (Fig. 1o). Hind claws heterodont, with 3 basal denticles and a serrated band consisting of a great number of microdenticles apically (Fig. 1p).

Abdomen: Outline of abdomen as in Fig. 1a. Lateral bristles on abdominal segments posteriorly decreasing in length, becoming stout and spatulate, very short on segments VIII and IX (Fig. 1c, 1d). Posteromedian process of tergum II triangular and of medium length. Operculate gill with short bristles on lateral and medial margins, posterior part of lateral margin with short spatulate bristles contrasting strongly with the long and thin bristles of hind margin (Fig. 1f, 1g). Row of microtrichia and lateral margin of operculate gill posteriorly diverging. The row runs more medially as in most other *Caenis* species, not reaching hind margin and posteromedial corner of the gill

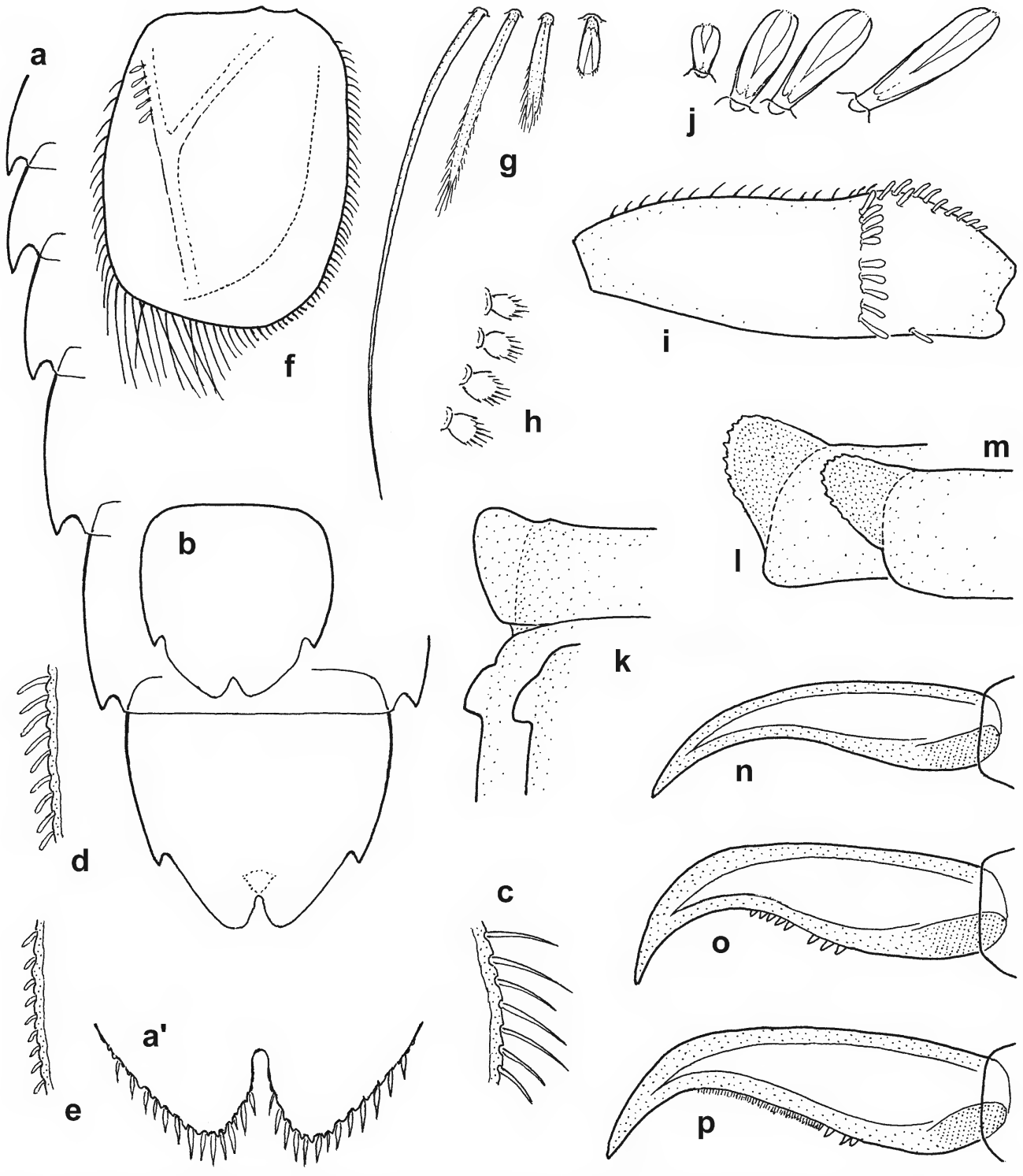



**Fig. 1.** *Caenis* sp. *spinosa*-group, larva. – **a**. Outline of abdomen, sterna IV–IX, ♀. **a'**. Hind margin of sternum IX. **b**. Sternum IX, ♂. **c**. Marginal setation of segment V. **d**. Marginal setation of segment VII. **e**. Marginal setation of segment IX. **f**. Operculate gill, general view. **g**. Bristles from hind margin of operculate gill, transition from short spatulate bristles to very long and thin ones. **h**. Microtrichia from ventral side of operculate gill. **i**. Fore femur with transverse row of bristles on dorsal side. **j**. Bristles from the transverse row on fore femur. **k**. Left half of pronotum and anterior part of mesonotum. **l**. Coxal process of mid leg. **m**. Coxal process of hind leg. **n**. Claw of fore leg. **o**. Claw of mid leg. **p**. Claw of hind leg.

(Fig. 1f), microtrichia more or less circular (Fig. 1h). Hind margins of terga VIII–X with denticles, VII with strong bristles of different length. Hind margin of sternum IX with a deep indentation and short spatulate bristles (Fig. 1a, 1a', 1b). Shagreen field on the base of the indentation large and triangular. Dorsal surface of abdomen densely covered with small denticles.

### Remarks

Subimaginal male genitalia from an adult larva show forcipes with tufts of long and strong spines. These characters, in combination with a dilated base of antennal flagellum (not dilated in *Caenis rugosa*) and sternum IX without colouration of sclerites (coloured in *C. johannae* and *C. rugosa*) lead to the *C. spinosa*-group.

## *Caenis* sp. cf. *spinosa* (larvae) (Fig. 2)

### Material

3 larvae: Madagascar, Betuboha, 8.XI.1991. – 4 larvae: P0205, Madagascar, Ambre 2, 4.IV.1994. – 1 larva: P0207, Madagascar, Sahankazo Ambany, Sakaramy, 5.IV.1994. – 2 larvae: P0307, Madagascar, Mangoky, Menamaty, Ranohira, 22.IV.1994. – 1 larva: P0336, Madagascar, Mandrare, Mananara, Ihazofotsy, 27.V.1994. – 1 larva: P0411, Madagascar, Mandrare, Antalimanga, Besomosoy, 24°05'45"S, 46°27'59"E, 25.IV.1995. – 5 larvae: P0416, Madagascar, Mandrare, Aff. Abetolo, Esira, 28.IV.1995. – 1 larva (♂ larva with SI-genitalia): P0417, Madagascar, Mandrare, Anatranatra, Esira, 24°17'37"S, 46°39'04"E, 28.IV.1995. – 1 larva: P0526, Madagascar, Manampanihy, Enosiari, 24°40'37"S, 46°49'19"E, 21.XI.1995. – 2 larvae: P0834, Madagascar, Antongombato, between Diégo et Namakia, 30.III.1999.

### Description

Measurements: ♂ larva of last instar: Body length 2.8–3.0 mm; length of cerci 2.0 mm; length of paracercus 2.2 mm. – ♀ larva of last instar: Body length 4.0–4.6 mm; length of cerci 2.6 mm; length of paracercus 2.8 mm.

Colouration of chitinous layers: Yellowish-brown.

Epidermal pigmentation: In most specimens no pigmentation visible, sometimes with a very inconspicuous greyish band on vertex and some spots on pronotum.

Head: Genae not bulged. Proximal comb of epipharynx short, consisting of long, stout, apically curved setae. Mandibles with elongated field of long bristles laterally. Dorsal surface without denticles. Aboral side of postmentum laterodorsally with numerous stout setae. Third segment of labial palp very short, second segment about 3 times as long as third segment (along the centre line).

Thorax: Sides of pronotum slightly convex, diverging posteriorly, with broadly rounded fore corners. Few strong bristles between coxal cavities of mid and hind legs. Coxal processes semi-elliptical or semicircular, margin with small denticles (Fig. 2k). Fore femur dorsally with a dense transverse row of sturdy, pseudobifid, not or very shortly pinnate, apically rounded bristles (Fig. 2j). Mid and hind femur dorsally with similar bristles of different length. Hind margins of all femora with long and pointed bristles. Fore tarsus ventrally with inner row of about 7 slightly unipinnate bristles. Mid tarsus with inner row of about 8 and outer row of 4 unipinnate bristles. Hind tarsus with inner row of 8–9 and outer row of 7–8 unipinnate bristles. Pinnae of bristles always directed medially. Fore claws with slender tip, basally with few very small denticles (Fig. 2f). Mid claws more compact and also with few basal denticles (Fig. 2g). Denticles of fore and mid claws sometimes hardly visible or lacking. Hind claws with a little stronger curved tip, few basal denticles and a row of micro-denticles (heterodont) (Fig. 2h).

Abdomen: Outline of abdomen as in Fig. 2a. Lateral margin densely covered with long bristles which are shorter on segments VII–IX (Fig. 2c, 2e). Posteromedian process of tergum II very flat and short triangular. Operculate gill dorsally with only few short bristles; ventral row of microtrichia originating near the gill base running parallel to the lateral margin and very close to the hind margin (pinnation of microtrichia sometimes overlapping the hind margin), ending close to the inner corner of the gill (Fig. 2d). Microtrichia semicircular, slightly pinnate. Hind margins of terga VII and VIII with long bristles. Hind margins of terga IX and X without bristles, but with denticles. Hind margin of sternum IX with a deep indentation and very thin and short bristles (Fig. 2a–c). Dorsal side of sternum IX caudally with a circular field of shagreen consisting of regularly arranged denticles (Fig. 2c).

Subimaginal genitalia from last instar larva (Fig. 2c): Forceps relatively long and slightly bowed, with tuft of short spines. Penis broad. Styliger sclerite with short apophyses. Sternum IX with long posterolateral spines and sublateral pigment dashes.

### Remarks

Subimaginal characters from an adult male larva (Esira, 28.IV.1995) are: Forceps with tuft of short spines (Fig. 2c); antenna with dilated base of flagellum; prosternal triangle narrow, pointed and basally pigmented (Fig. 2i); two transverse pigment-bands on vertex; pronotum at hind margin with two submedian spots; abdominal terga with sublateral marks. All these characters lead to *Caenis spinosa*.

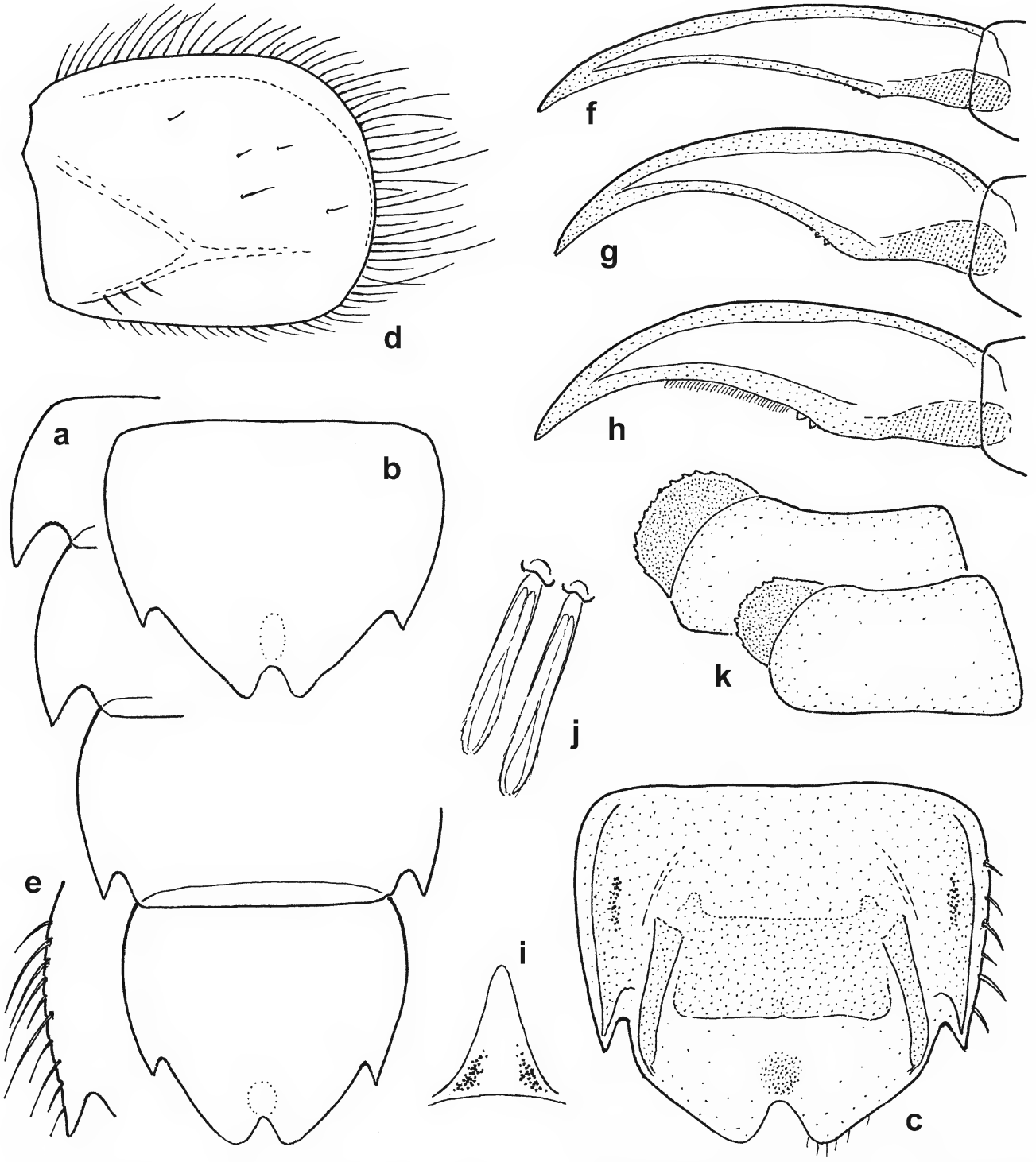



**Fig. 2.** *Caenis* sp. cf. *spinosa*, larva. – **a**. Outline of abdomen, sterna VI–IX, ♀. **b**. Sternum IX, ♀, another shape. **c**. Sternum IX, ♂, with subimaginal genitalia. **d**. Operculate gill, general view. **e**. Marginal setation of segment VII. **f**. Claw of fore leg. **g**. Claw of mid leg. **h**. Claw of hind leg. **i**. Subimaginal prosternum from an adult ♂ larva. **j**. Bristles from the transverse row on fore femur. **k**. Coxal processes of mid leg (left) and hind leg (right).

### *Caenis* sp. cf. *johannae* (larvae)
(Fig. 3a–h)

#### Material

10 larvae (1 ♂ larva with SI-genitalia): P0602, Madagascar, Maharivo, Befasy, 20°34'18"S, 44°20'45"E, 27.V.1996.

#### Description

Measurements: ♂ larva of last instar: Body length 2.8 mm. – [♀ larva of last instar not available].

Colouration of chitinous layers: Yellowish-brown.

Epidermal pigmentation: Except a band between the lateral ocelli, the region around the frontal ocellus, a spot at the base of the wing buds, and dashes on the fore corners of pro- and metanotum, no further pigmentation can be observed (in contrary to the subimago).

Head: Genae slightly bulged. Proximal comb of epipharynx of medium length, consisting of strong, slightly curved, apically denticulated setae, the proximal ones pinnate. Mandibles laterally without long bristles, densely tuberculate on dorsal surface. Aboral side of postmentum laterodorsally without strong setae. Third segment of labial palp short, second segment about twice as long as third segment (along the centre line).

Thorax: Sides of pronotum more or less parallel, slightly curved. Few fine hairs between coxal cavities of fore and mid legs and between mid and hind legs. Coxal processes narrow sickle-shaped, margins smooth or with few very small denticles, 2–3 long setae (Fig. 3c, 3d). Fore femur dorsally with an irregular transverse row or band of long and sturdy, pseudobifid bristles which are not or very shortly pinnate (Fig. 3h). Mid and hind femur dorsally with similar bristles of same length or longer. The same type of bristles on hind margins of all femora. Tibiae with sturdy pointed bristles. Fore tarsus ventrally with inner row of 5–9 simple bristles. Mid tarsus with inner row of 6–8 simple bristles and outer row of 2–5 unipinnate bristles. Hind tarsus with inner row of 6–10 simple bristles and outer row of 4–7 unipinnate bristles. Pinnae of bristles always directed medially. All claws long and slender, with 4–6 basal denticles (Fig. 3e–g). Hind claws additionally with a row of micro-denticles (heterodont) (Fig. 3g).

Abdomen: Posterolateral processes short. Lateral margin densely covered with bristles of medium length, on segments VIII–IX shorter. Posteromedian process of tergum II very flat and short triangular, often not visible in dorsal view. Operculate gill dorsally with numerous long bristles (Fig. 3b). Ventral row of microtrichia originating near the gill base. Row of microtrichia and lateral margin of operculate gill parallel. The row ends near the inner hind corner of the gill, running very close to the hind margin (pinnation of microtrichia sometimes overlapping the hind margin) (Fig. 3b). Microtrichia short, with straight lateral spines, trapezoid or semicircular. Hind margins of terga VII and VIII with long bristles. Hind margins of terga IX and X without bristles, but with denticles. Hind margin of sternum IX with very thin bristles and a deep indentation (Fig. 3a). Dorsal side of sternum IX at the base of the indentation with a circular field of shagreen consisting of regularly arranged denticles.

Subimaginal genitalia from last instar larva (Fig. 3a): Forceps short and straight, with tuft of long spines. Penis relatively narrow. Strong pigment dashes, marking lateral and basolateral sclerites, are situated relatively close to styliger sclerite. Lateral parts of sternum IX strongly pigmented, with long sublateral pigment dashes.

#### Remarks

Subimaginal characters from an adult male larva are: Forceps relatively short, with tuft of long spines (Fig. 3a); antenna with dilated base of flagellum; the strong and differentiated pigmentation of epidermis nearly identical with that of males of the type series (Malzacher 1995), particularly the strong brown colour of head, abdomen and lateral parts of sternum IX (the latter marks the position of the lateral sclerite) (Fig. 3a). All these characters lead to *Caenis johannae*.

### *Caenis* sp. A (larvae)
(Figs. 3i–k, 7)

#### Material

1 larva: P0177, Madagascar, Mangoky, Zomandao, Andringitra nord camp 6, 28.XI.1993. – 1 larva: P0207, Madagascar, Sahankazo Ambany, Sakaramy, 12°26'50"S, 49°17'21"E, 5.IV.1994. – 1 larva: P0226, Madagascar, Namorona, Namorona, route Ifanadiana–Tolongoina, 22.IV.1994. – 1 larva: P0339, Madagascar, Mandrare, Mananara, Hazofotsy, 2.VI.1994. – 1 larva: P0476, Madagascar, Tsiribihina, Aff. de Sakay, Sakay Babetville, 18°59'57"S, 46°31'47"E, 10.X.1995. – 1 larva: P0495, Madagascar, Betsiboka, Mananara, Mangamila, 18°34'40"S, 47°51'42"E, 30.X.1995. – 1 larva: P0595, Madagascar, Tsiribihina, Sahaomby, Manatoloza, 19°25'50"S, 46°57'53"E, 21.V.1996. – 1 larva: P0725, Madagascar Rianila, Ambodiaviavy, Sandrakatrana, 18°57'31"S, 48°39'45"E, 30.IV.1998. – 3 larvae: P0727, Madagascar, Sandrakatrana, Ambodiaviavy, 18°57'45"S, 48°40'16"E, 30.IV.1998.

#### Description

Measurements: [♂ larva of last instar not available]. – ♀ larva of last instar: Body length 5.5–5.7 mm; length of cerci 2.8 mm; length of paracercus 3.0 mm.

Colouration of chitinous layers: Yellowish-brown to yellowish-white, no lightenings visible.

Epidermal pigmentation: Very sparsely and diffuse on vertex and operculate gills, often totally lack-

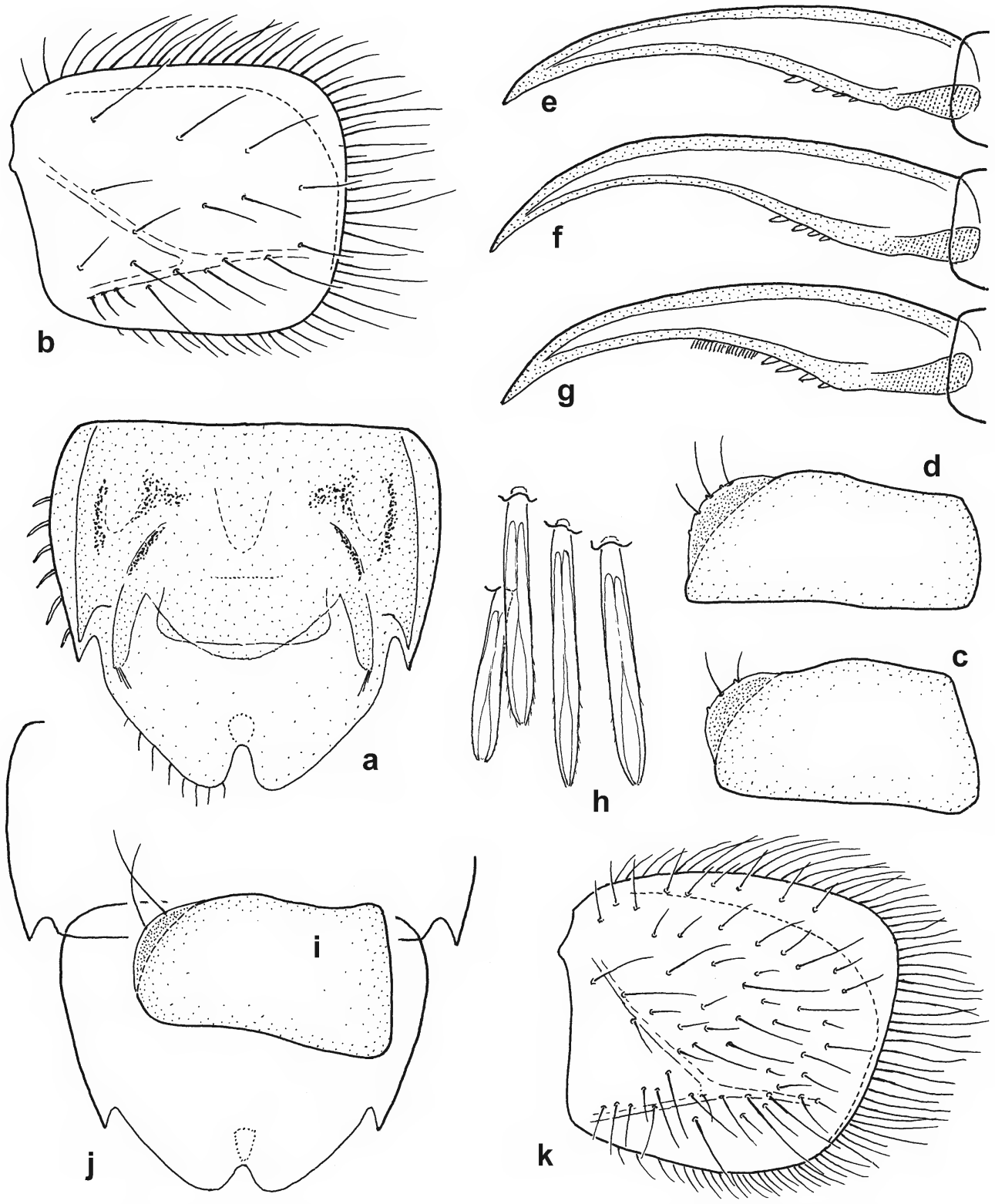



**Fig. 3.** *Caenis* sp. cf. *johannae*, larva (a–h). – **a**. Sternum IX, ♂, with subimaginal genitalia. **b**. Operculate gill, general view. **c**. Coxal process of hind leg. **d**. Coxal process of mid leg. **e**. Claw of fore leg. **f**. Claw of mid leg. **g**. Claw of hind leg. **h**. Bristles from the transverse row on fore femur. – *Caenis* sp. A, larva (i–k). – **i**. Coxal process of hind leg. **j**. Outline of abdominal sterna VIII and IX. **k**. Operculate gill, general view.

ing. Only one specimen shows a stronger blackish-brown pigmentation: a band between the lateral ocelli, numerous spots and dashes on pro- and mesonotum, femora with subapical spots, and sublateral marks on abdominal terga. Intensity of pigmentation seems to be highly variable (see Remarks below).

Head: Genae slightly bulged. Proximal comb of epipharynx consisting of strong, slightly curved, apically denticulated setae. Mandibles with elongated field of long bristles laterally. Dorsal surface without denticles. Second segment of labial palp about twice as long as third segment (along the centre line).

Thorax: Sides of pronotum nearly parallel, straight or slightly bowed. Coxal processes narrow band-shaped, not bulging out from the outline of coxa (Fig. 3i). Transverse row of bristles on fore femur dense and straight, consisting of 8–14 long, blunt and pseudobifid bristles which are apically not or only slightly pinnate. Dorsal surface and margins of mid and hind femora with long, slender and pointed bristles which are sometimes very long and hair-like. Fore tarsus with an irregular row of 15–18 very long, simple bristles. Mid tarsus with an inner row of about 13 and an outer row of about 10 long and slender, more or less pinnate bristles. Hind tarsus with an inner row of about 15 and an outer row of about 13 bristles of the same shape. Fore claws very long and slender, slightly curved. Mid and hind claws also long and slender, apically more or less bent, all claws with 6–8 denticles. Hind claws without row of microdenticles (homodont).

Abdomen: Lateral bristles on abdominal segments long or very long. Posteromedian process of tergum II very short, band-shaped, nearly not visible in dorsal view. Operculate gill with long to very long and hair-like marginal bristles, same bristles on the dorsal side (Fig. 3k). Row of microtrichia and lateral margin of operculate gill posteriorly diverging. The row ends at the inner posterior corner of the gill cover (Fig. 3k), microtrichia more or less circular or elliptical. Hind margins of terga VII and VIII with long hair-like bristles, IX with bristles and median denticles, X with denticles. Sternum IX broader than in other species; hind margin with a broad v-shaped incision and long pointed bristles. Shagreen field on the base of the incision elliptical or elongated triangular (Fig. 3j).

Structure of surface: Epicuticula extensively smooth. Dorsal and ventral body surface covered with hair-like bristles of different length. Larva looks mouldy in lower magnification.

### Remarks

Intensity of setation, especially of the operculate gills, and intensity of pigmentation can be variable as well as other characters: mid and hind claws are sometimes strongly bent apically and the outer rows of bristles on mid and hind tarsi can be reduced to few bristles. So it seems to be possible that there are two or more *Caenis* species with body setation.

In case the herein treated species turns out to be undescribed, "*trichocaenoides*" would be a suitable species name for it, referring to the numerous long bristles on the surface of the body (similar as in the new genus *Trichocaenis* which is described below). It can, however, not be ruled out that the larvae described above might belong to one or more already known species.

## 3.2 Genus *Trichocaenis* n. gen. (larvae)

Type species: *Trichocaenis inexperta* n. sp.

### Etymology

The first part of the genus name refers to the great number of hair-like bristles covering the body surface.

### Diagnosis

Larvae of this genus can be characterised and distinguished from all other genera of Caenidae by the following combination of characters:

Body surface covered with hair-like bristles. Head with ridges (Fig. 8), but neither with ocellar tubercles nor with microscopic pits. Clypeus not protruding anteriorly. Maxillar and labial palps three-segmented. Basal segment of labial palp nearly as broad as long. Thorax broadened (Fig. 4). Sides of pronotum converging anteriorly. Fore tibia and fore tarsus without very long bristles. Femora distinctly longer than broad and distinctly broader than tibiae, without extended plates. Operculate gill ventrally with lateral band of spines, clusters of spines and preliminary stages of scales (Fig. 5b, 5c). Filaments of gills III–VI simple or with 2 branches only (one or two apical filaments with 3 or 4 branches). Lateral spines of abdomen not bent dorsally. Abdominal terga VII–IX without mediolongitudinal ridge. Shagreen field on dorsal side of posterior part of sternum IX lacking. Hind margin of sternum IX without a bi-pointed process with concave margin between the points.

*Trichocaenis* n. gen. has ridges on head and the broad thorax with converging sides of pronotum (Figs. 4, 8). The new genus can be distinguished from closer related genera as follows: Long hair-like bristles are lacking on dorsal and ventral surface of *Clypeocaenis*, *Barnardara* and *Callistinella*. All *Caenis* species have the ventral side of the operculate gill with a very regularly arranged row or band of very differentiated scale-shaped microtrichia (such a row is absent in *Trichocaenis*).

*Trichocaenis inexperta* **n. sp.** (larvae)
(Figs. 4, 5, 8, 12)

Material

Holotype (larva): P0636, Madagascar, Namorona, Tsaratango, 21°16'33"S, 47°31'50"E, 8.XI.1996.

Paratype: 1 larva: without data.

Holotype and paratype are stored in the Museum of Zoology Lausanne.

Etymology

The species name *inexperta* (Latin: inexpertus = still unknown) refers to the still unknown imaginal stages.

Description

Measurements: ♀ larva subadult: Body length 4.8 mm.

Colouration of chitinous layers: Very pale, brownish-yellow to white. Diffuse lightenings medially to wing buds.

Epidermal pigmentation: Metanotum and abdominal terga I–VIII with brown pigments, IX and X as well as lateral marginal region pale.

Head: Genae flat. Proximal comb of epipharynx short, consisting of strong slightly curved and apically denticulated setae, a field of long and thin setae laterad to the comb overlapping it partially. Right distal field of thick setae only slightly smaller than the left one. Mandibles laterally with numerous hair-like bristles. Maxillar palp relatively short, not overlapping the galea-lacinia. First segment of labial palp nearly as broad as long, third segment relatively long, second segment about 1.4 times as long as the third segment (along the centre line) (Fig. 5d). Ventral side of labium, particularly postmentum, praementum, and first and second segment of labial palp with numerous long hair-like bristles.

Thorax: Sides of pronotum nearly without flattened border, straight and smooth, anteriorly converging (Fig. 4). Coxal processes narrow band-shaped, not bulging out from the outline of coxa, not denticulated (Fig. 5h, 5i). Fore femur without transverse row of bristles, but with numerous hair-like bristles of different length all over the surface, as in mid and hind femora (Fig. 4). All tarsi with only one row of 10–15 simple bristles. Claws slender and slightly curved, with 6–8 denticles. Hind claws homodont (Fig. 5e–g).

Abdomen: Posterolateral spines on abdominal segments rather short with narrow bases (Fig. 5a). Posteromedian process of tergum II lacking. Operculate gill dorsally with numerous long bristles along the y-shaped ridge; three long bristles in a sublateral row (Figs. 5b). Ventral side with a sublateral band of spines, clusters of spines and preliminary stages of scales (Figs. 5b, 12). Gills III–VI relatively small, delicate and translucent, marginal filaments simple or bifurcate, only 1–2 apical filaments with more than two branches. Hind margins of terga VII and VIII with bristles of different length, IX with bristles and denticles, X with denticles only. Hind margin of sternum IX rounded with long sturdy bristles bent together medially. No shagreen field on dorsal side. Caudal filaments with short and strong spines (Fig. 5j, 5k).

Structure of surface: Epicuticula extensively smooth. Body surface covered with hair-like bristles of different length, evenly distributed on ventral side and concentrated in groups dorsally (Fig. 4). Operculate gill dorsally with numerous long bristles. Larva looks mouldy in lower magnification.

Differential Diagnosis

See diagnosis of *Trichocaenis* n. gen.

### 3.3 Genus *Callistinella* Sun & McCafferty, 2004

*Callistina* Sun & McCafferty, 2002 [homonym of *Callistina* Jukes-Browne, 1908 (Mollusca)]

Larvae of this genus can be characterised and distinguished from all other genera of Caenidae by the following combination of characters:

Long bristles on body surface extensively lacking. Thorax broadened. Head without ocellar tubercles. Vertex, frons and thoracic nota with ridges and pits with branched setae (Figs. 9, 10). Clypeus not protruding anteriorly. Maxillar and labial palps three-segmented. Basal segment of labial palp as long as broad, square or circular. Sides of pronotum converging anteriorly. Prosternum anteriorly with rounded process covered with short and stout bristles (Fig. 6g). Fore tibia and fore tarsus without very long bristles. Femora distinctly longer than broad and distinctly broader than tibiae, without extended plates. Operculate gill ventrally with sublateral band of spines, clusters of spines and preliminary stages of scales not reaching the hind corner (Fig. 6e). Filaments of gills III–VI simple or with 2 branches only (one or two apical filaments with 3 or 4 branches). Lateral spines of abdomen not bent dorsally. Abdominal terga VII–IX with mediolongitudinal ridge anteriorly more or less protruding (Fig. 6a). Shagreen field on dorsal side of posterior part of sternum IX lacking. Hind margin of sternum IX without a bi-pointed process with concave margin between the points.

*Callistinella* sp. (larvae)
(Figs. 6, 9–11)

Material

1 larva (♂ larva with SI-genitalia): Madagascar, riv. Zomandao sur le plateau (Mangoky-bassin), 29.XI.1993. – 1 larva: 159, Madagascar, R. Antomboka, Joffreville (M. D'Ambre, An-

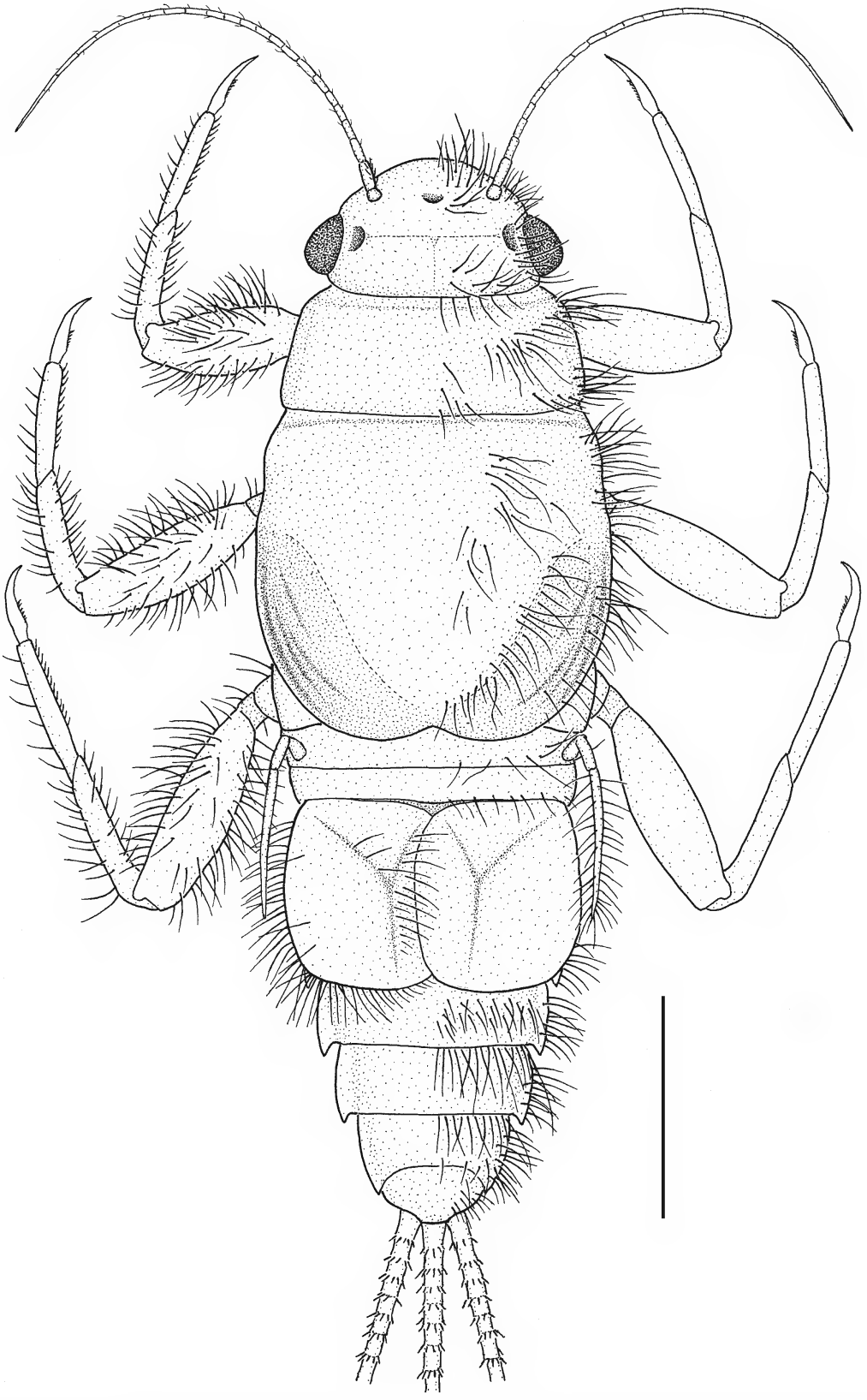


**Fig. 4.** *Trichocaenis inexperta* n. sp., larva. Habitus; right half with setae on body surface and outline, left half with setae on legs and second gill. – Scale: 1 mm.

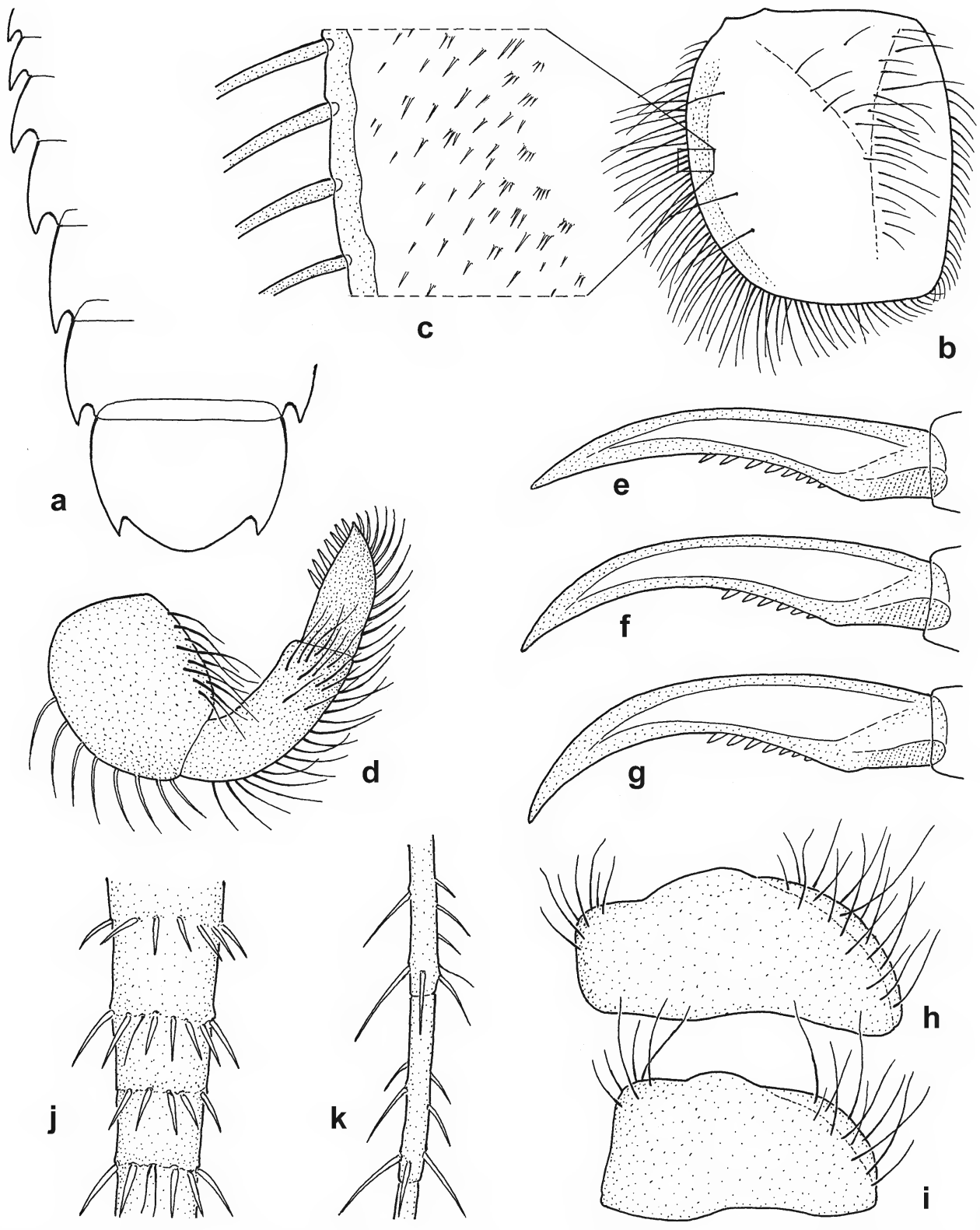



**Fig. 5.** *Trichocaenis inexperta* n. sp., larva. – **a**. Outline of abdomen, sterna III–IX, ♀. **b**. Operculate gill, general view. **c**. Sector of sublateral band of microtrichia on ventral side of operculate gill. **d**. Labial palp. **e**. Claw of fore leg. **f**. Claw of mid leg. **g**. Claw of hind leg. **h**. Coxal process of mid leg. **i**. Coxal process of hind leg. **j**. Basal sector of terminal filament. **k**. Medial sector of terminal filament.

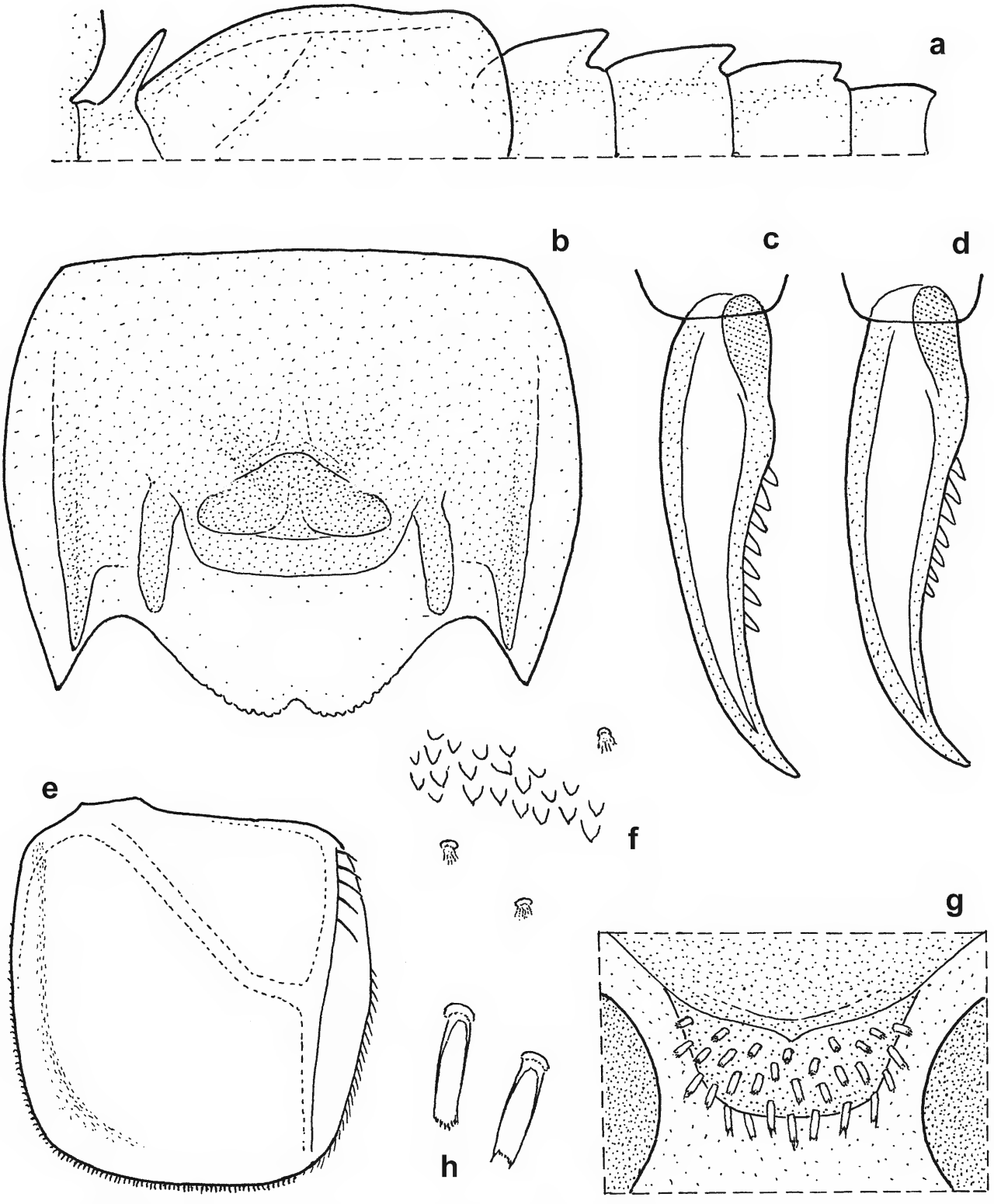



**Fig. 6.** *Callistinella* sp., larva. – **a**. Abdomen, lateral view of dorsal part. **b**. Sternum IX, ♂, with subimaginal genitalia. **c**. Claw of fore leg. **d**. Claw of hind leg. **e**. Operculate gill, general view. **f**. Operculate gill, epicuticular structure of dorsal surface. **g**. Anterior process of sternum. **h**. Bristles on anterior process of sternum.

tsiranana), 950 m, 19.XI.2001. – 2 larvae: 165, Madagascar, R. Antomboka, Joffreville (M. D'Ambre, Antsiranana), 850 m, 21.XI.2001. – 1 larva: Same data as before, but 166.

## Description

Measurements: ♂ larva of last instar: Body length 3.0–3.7 mm; length of cerci 1.6 mm; length of paracercus 2.3 mm. – [♀ larva of last instar not available].

Colouration of chitinous layers: Brownish-yellow to orange.

Epidermal pigmentation: Central parts of clypeus and frons, and posterior margin of vertex brown, rest of vertex light, sometimes with few brown dashes. Thoracic nota and pleura dark-brown to blackish-brown, sometimes with a pattern of a little lighter spots and areas, abdominal terga I, II, and VII–X brown to dark-brown, terga III–VI with light-brown pigments visible through the pale and translucent gills. Ventral side more or less light-brown, abdominal sterna III–VI light. Femora and tibiae sometimes with longitudinal light-brown bands.

Head: Vertex and frons with cephalic ridges and elevations (Fig. 9). Genae bulged, semi-elliptical. Labrum with long bifurcate, pinnate bristles (Fig. 11). Proximal comb of epipharynx long, consisting of long, apically blunt setae, the proximal ones strongly curved. Mandibles without long bristles. Dorsal surface strongly tuberculate. Aboral side of postmentum laterodorsally with thin and short bristles. Third segment of labial palp nearly as long as the second one, slightly bent medially.

Thorax: Sides of pronotum nearly without flattened border, straight and strongly notched, anteriorly converging. Prosternum anteriorly with a rounded process covered with numerous short and stout, apically frayed or bifurcate bristles (Fig. 6g, 6h). Coxal processes semicircular or tongue-shaped, strongly tuberculate, with few thin and short bristles at the margin. Fore femur dorsally with an interrupted transverse row of short and sturdy pseudobifid bristles which are apically rounded but not pinnate. Mid and hind femur dorsally without bristles. Margins of all femora with short, stout pseudobifid bristles. Fore tarsus ventrally with inner row of 7–9 simple bristles, outer row with about 4 simple bristles which are sometimes slightly unipinnate. Mid tarsus with inner row of about 7 and outer row of about 5 unipinnate bristles. Hind tarsus with inner row of 7–9 and outer row of 5–7 unipinnate bristles. Pinnae of bristles always directed medially. All claws very similar, somewhat stout, with 5–7 sturdy denticles. Hind claws homodont (Fig. 6c, 6d).

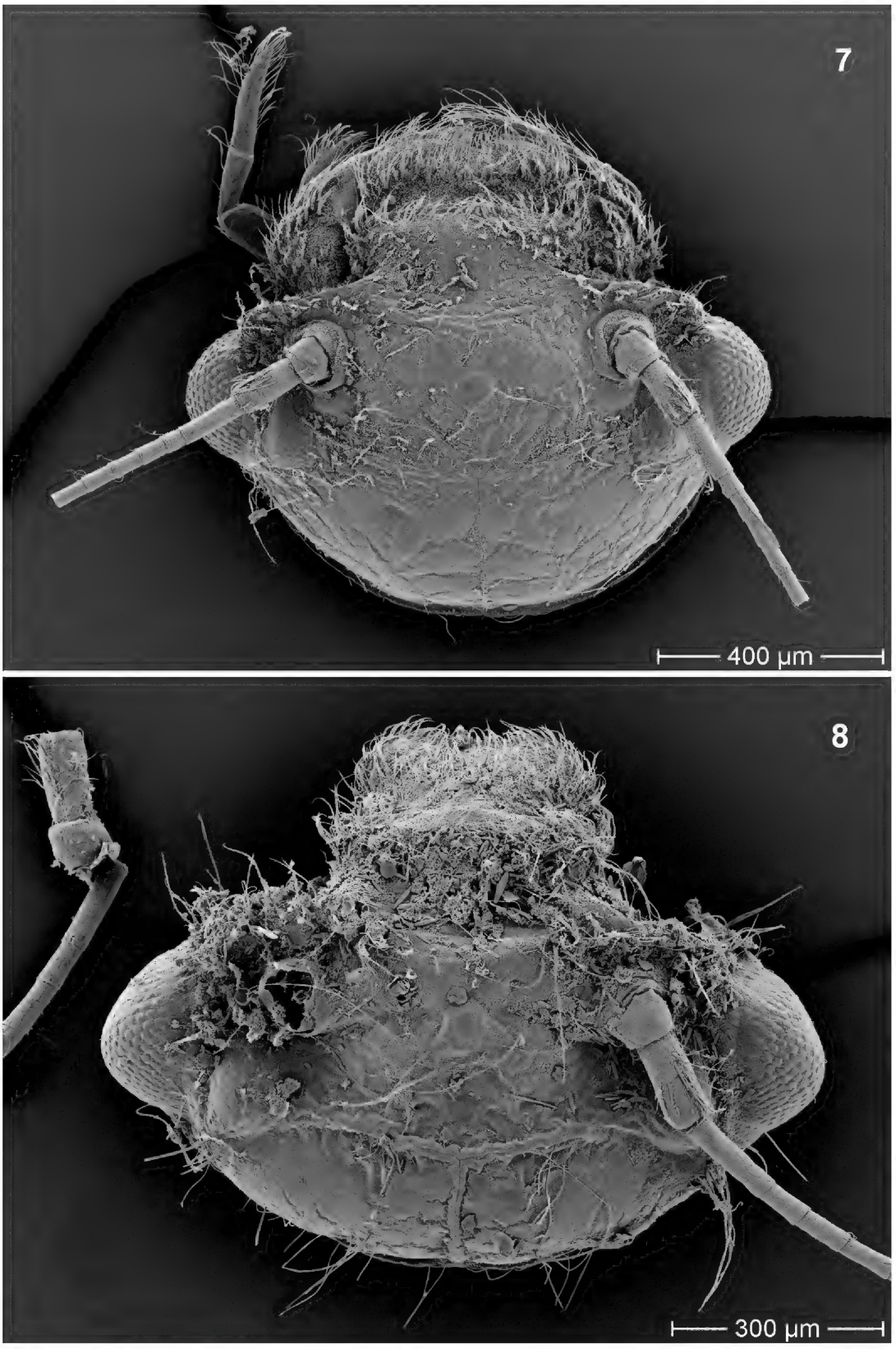
Abdomen: Posterolateral processes short, posteriorly directed; process II conspicuously stronger and longer. Lateral margins with few short, spine-shaped bristles. Posteromedian process of tergum II triangular, pointed. Margin of operculate gill only with few short, sturdy, pseudobifid and apically rounded bristles; 3–5 sturdy pointed bristles at base of inner ridge (Fig. 6e). An irregular row or band of microtrichia with different preliminary stages of scales on the ventral side ending medially to the outer corner of the gill, not reaching the hind margin (Fig. 6e). Gills III–VI relatively small, delicate and translucent, marginal filaments simple or bifurcate, only one apical filament with 3 branches. The longest filament does not reach the length of the gill plate. Gill VI only with simple filaments. Hind margins of all visible terga strongly denticulated, without bristles. Abdominal terga VII–IX with mediolongitudinal ridge anteriorly more or less protruding (Fig. 6a). Hind margin of sternum IX slightly indented (Fig. 6b). No shagreen field on dorsal side.

Structure of surface: Head and thoracic nota with ridges and pits with branching setae, but not as conspicuous as in *Callistinella panda* (Figs. 9, 10). Other parts of body surface, femora, tibiae and operculate gills densely covered with tubercles or denticles, sometimes forming overlapping, strongly pointed epicuticular scales (Fig. 6f). Long bristles or setae lacking.

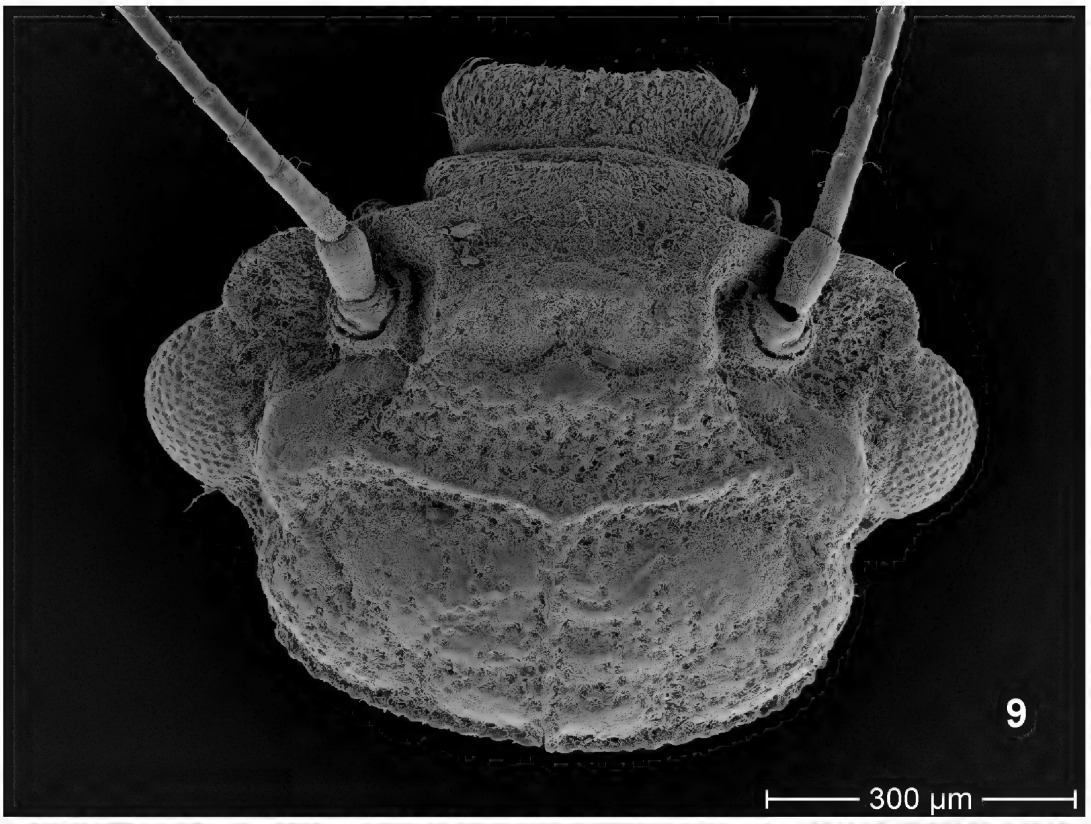
Subimaginal genitalia from last instar larva (Fig. 6b): Forceps relatively short, without spines, basally narrowed. Penis with strongly marked ventral fold and rounded lobes. Sternum IX with very long and slender posterolateral spines.

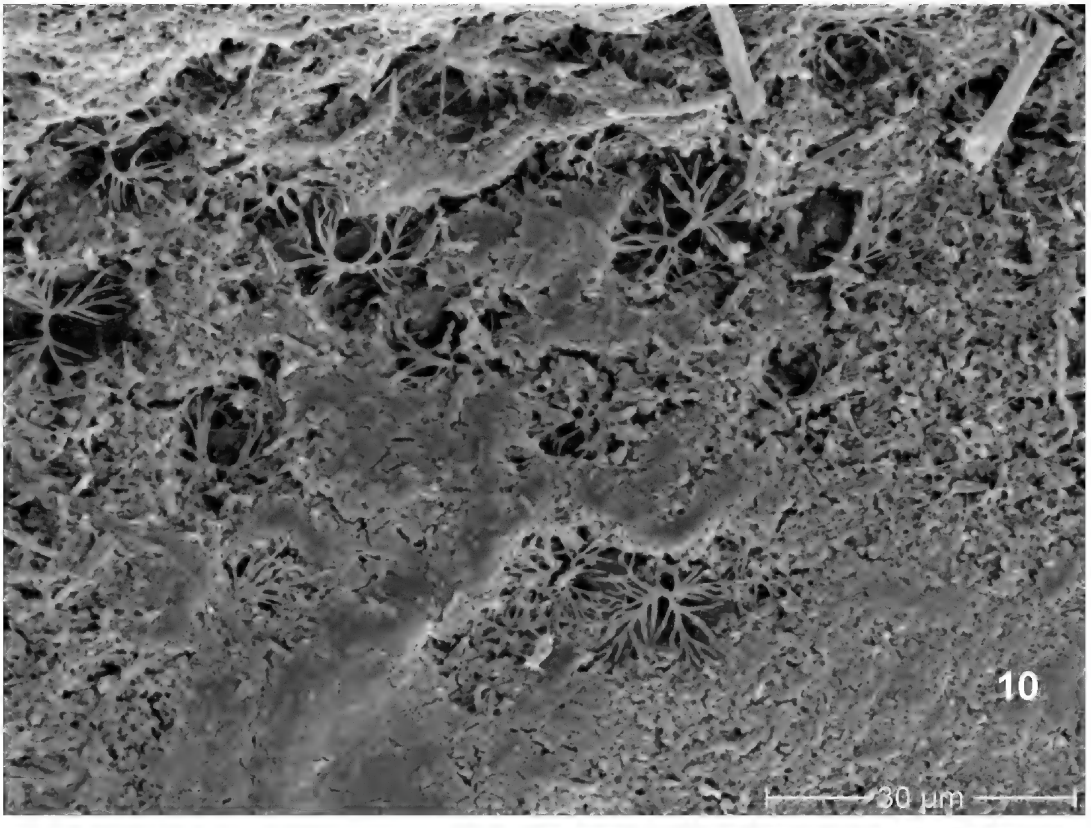
## Remarks

*Callistinella* sp. is very similar to *Callistinella panda* (Sun & McCafferty, 2002) but there are some differences. The most conspicuous ones concern the colouring: The clear contrast between light parts (head and operculate gill area) and blackish-brown parts (rest of the body) in *Callistinella panda* is slightly diminished in the herein described species. Its head is partly coloured (see above) and terga III–VI are more or less with brownish pigments shining through operculate gills, causing a pale brownish colour, whereas in *Callistinella panda* these parts are yellowish-white to cream-coloured. Ridges on head and thorax are comparatively weaker and pits not as deep and regular as in *Callistinella panda*, the enclosed setae more irregular and with very thin branches (only visible in SEMs). Circum-antennal depressions do not reach the lateral ocelli, i. e. parts between ocelli and antennal bases are elevated (they are deeply depressed in *Callistinella panda*). Dorsal side of labrum densely covered with bifurcate and strongly pinnate bristles (labrum of *Callistinella panda* dorsally only with sparce setae) (compare Figs. 9–11 with figs. 3, 9 and 10 in Sun & McCafferty 2002). Further remarks see chapter Discussion.

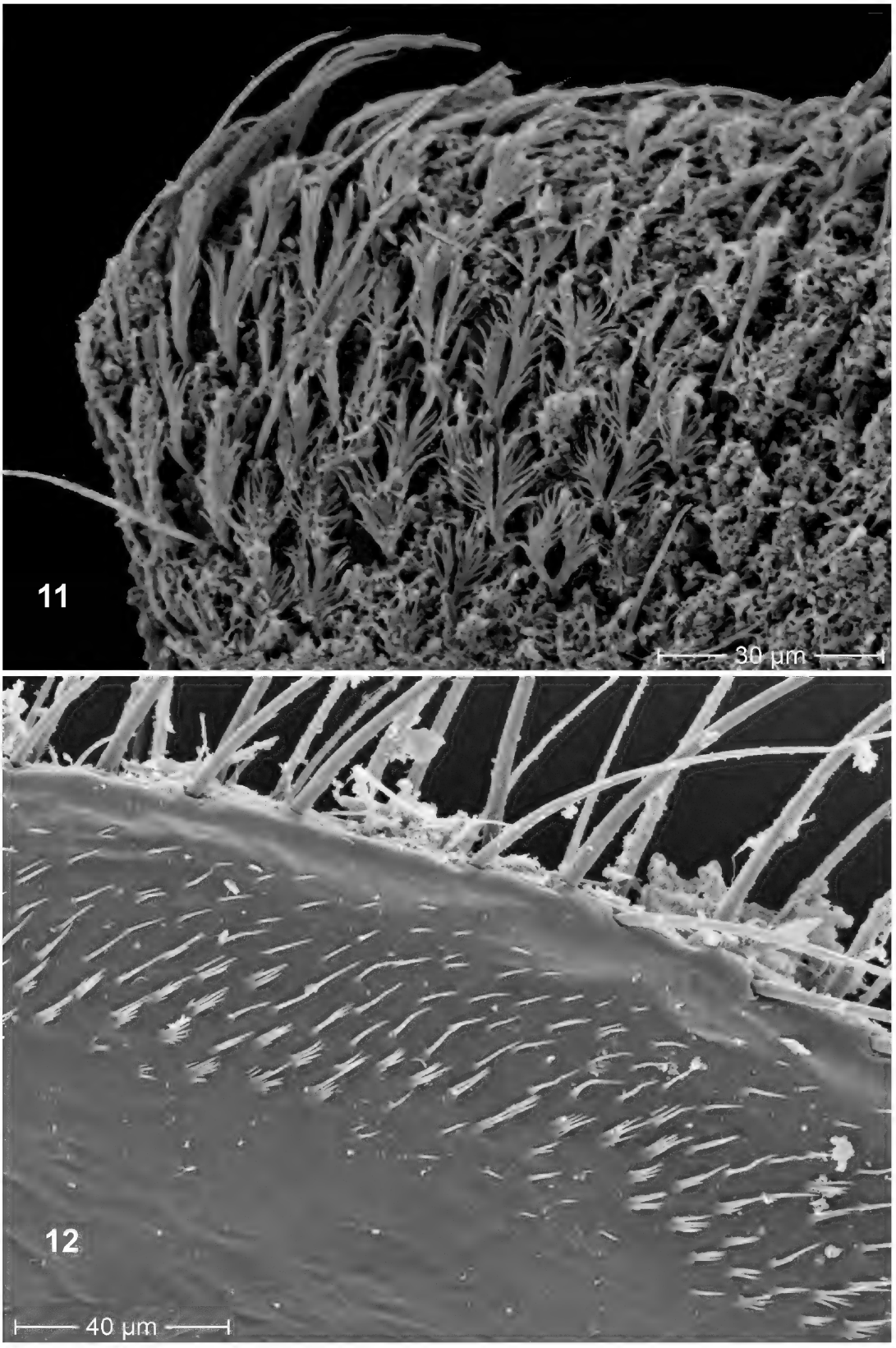



**Figs. 7–8.** Caeninae spp., larvae, head, dorsal view. – **7**. *Caenis* sp. A. **8**. *Trichocaenis inexperta* n. sp.




**Figs. 9–10.** *Callistinella* sp., larva. – **9**. Head, dorsal view. **10**. Vertex, epicuticula with pits and branching setae.




**Figs. 11–12.** Caeninae spp., larvae. – **11**. *Callistinella* sp., labrum with bifurcate and pinnate bristles, dorsal side. **12.** *Trichocaenis inexperta* n. sp., spines, clusters of spines and preliminary stages of scales on ventral side of operculate gill.

### 4 Preliminary key to Caeninae larvae of Madagascar

1 Pro- and mesonotum with longitudinal ridges. Abdominal terga VII–IX with mediolongitudinal ridge more or less protruding anteriorly (Fig. 6a). Prosternum anteriorly with a rounded process covered with short and stout bristles (Fig. 6g, 6h). Lateral margin of abdomen with short or very short spatulate bristles. . . . . ***Callistinella***

– Pro- and mesonotum without longitudinal ridges. Abdominal terga VII–IX without mediolongitudinal ridge. Prosternum without a conspicuous process. Lateral margin of abdomen with longer bristles. . . . . **2**

2 Body surface covered with long bristles dorsally and ventrally (Fig. 4). Hind claw homodont, with a basal row of denticles equal in shape and size (Fig. 5g). . . . . **3**

– Long hair-like bristles on dorsal and ventral body surface lacking. Hind claw heterodont, with 2–5 basal denticles, and a band of microdenticles more or less fused together (Figs. 1p, 2h, 3g). . . . . **4**

3 Lateral margins of pronotum converging anteriorly. Longitudinal band or cluster of long bristles on dorsal side of fore femur, no transverse row (Fig. 4). Microtrichia on ventral side of operculate gill forming a sublateral band with spines, clusters of spines and primitive scales (Figs. 5b, 5c, 12). . . . . ***Trichocaenis* n. gen.**

– Lateral margins of pronotum nearly parallel, straight or slightly bowed. Transverse row of 10–14 bristles on dorsal side of fore femur. A row of well-developed scale-shaped microtrichia on ventral side of operculate gill. . . . . ***Caenis* sp. A**

4 Lateral margin of operculate gills and posterior abdominal segments with short spatulate bristles (Fig. 1d–f). Row of microtrichia and lateral margin of operculate gill distinctly diverging posteriorly; the row runs distant from the lateral margin and does not reach the hind margin of the gill (Fig. 1f). Side of mesonotum in its anterior part with a more or less hooked process (Fig. 1k). Hind margins of terga VIII–X with denticles, VII with strong bristles of different length. . . . . ***Caenis* sp. cf. *spinosa*-group**

– Lateral margin of operculate gills and posterior abdominal segments with long and thin bristles (Figs. 2d, 2e, 3b). Row of microtrichia and lateral margin of operculate gill more or less parallel; the row runs closer to the lateral margin (Figs. 2d, 3b). Side of mesonotum in its anterior part without hooked process. Hind margins of terga IX and X with denticles, VII and VIII with long bristles. . . . . **5**

5 Dorsal surface of operculate gill only with few short bristles (Fig. 2d). Coxal processes semicircular (Fig. 2k). Mid and hind claws stout with curved tip; basally with 2–3 very small, often unrecognisable denticles (Fig. 2g, 2h). . . . . ***Caenis* sp. cf. *spinosa***

– Dorsal surface of operculate gill with long or very long bristles (Fig. 3b). Coxal processes narrow sickle-shaped (Fig. 3c, 3d). Mid and hind claws very elongated and slender; 4–5 basal denticles (Fig. 3f, 3g). . . . . ***Caenis* sp. cf. *johannae***

## 5 Discussion

The assignment of the herein described larvae to *Caenis spinosa* and *C. johannae* is likely because of the subimaginal genitalia, but at present it cannot be proved with absolute certainty.

Four genera of the subfamily Caeninae from Africa and Madagascar have been described from striking larval characters, without knowledge of the adults: *Clypeocaenis* Soldán, 1978, *Barnardara* Provonsha & McCafferty, 1995, *Callistinella* Sun & McCafferty, 2004 and the herein newly described *Trichocaenis*. The latter three genera are known from the Afrotropical region only, whereas *Clypeocaenis* was described first from Iran and India. Adults and a new species from Africa, *Clypeocaenis afrosetosa*, were described later by Soldán (1983). Soldán gives a couple of imaginal characters for separating *Clypeocaenis*, but most of them are within the variability of *Caenis*. The only character that does not occur in species of *Caenis*, the protrusion of the clypeus, is inconspicuous and often hardly visible. So in *Clypeocaenis* the adults are actually known but not distinguishable from adults of *Caenis*.

The subimaginal male genitalia visible through the cuticutle of last instar larvae of *Callistinella* are very similar to the genitalia of *Caenis rutila* Malzacher, 1995 (compare Fig. 6b with fig. 6a of Malzacher 1995). Therefore there is a high probability that the larvae of *Callistinella* actually represent species of the *Caenis rutila*-group. However, until all doubts are dispelled by rearing adults from larvae, *Caenis rutila* should not be renamed to *Callistinella rutila*.

It also cannot be completely ruled out that the larvae of *Trichocaenis* n. gen. might belong to an already known species of *Caenis* (e. g. *C. rugosa* Malzacher, 1995), but this is not very likely.

As already mentioned above in this chapter, *Trichocaenis* belongs to the Caeninae genera which show striking apomorphic larval characters (in *Trichocaenis*: ridges on head and the broad thorax with converging sides of pronotum).

Recently the genera *Clypeocaenis*, *Barnardara*, *Callistinella* and *Trichocaenis* (the latter described herein) were united in the *Clypeocaenis*-group, based on the shape and arrangement of the microtrichia on the ventral side of the operculate gills (Malzacher in press). An assessment of the phylogenetic position of this group, including all differential diagnostic characters, is in preparation.

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# A new and a little known species of *Cryptocephalomorpha* Ritsema (Coleoptera: Carabidae: Pseudomorphinae)[1]

Martin Baehr

Abstract

A new species of the pseudomorphine genus *Cryptocephalomorpha* Ritsema is described from Laos: *Cryptocephalomorpha maxima* **n. sp.** The key to the species of *Cryptocephalomorpha* in Baehr (1997) is updated to include the new species. Two additional records of the unique African pseudomorphine species, *Cryptocephalomorpha genieri* Baehr, 1997 are communicated from Botswana and Zambia. They corroborate the occurrence of this species in central southern Africa.

K e y w o r d s : Coleoptera, Carabidae, *Cryptocephalomorpha*, new species, Asia, Africa.

Zusammenfassung

Aus der Pseudomorphinen-Gattung *Cryptocephalomorpha* Ritsema wird eine neue Art aus Laos beschrieben: *Cryptocephalomorpha maxima* **n. sp.** Der Bestimmungsschlüssel zu den Arten von *Cryptocephalomorpha* in Baehr (1997) ist überarbeitet, um die neue Art aufzunehmen. Zwei weitere Exemplare der einzigen afrikanischen Pseudomorphinen-Art, *Cryptocephalomorpha genieri* Baehr, 1997 werden aus Botswana und Zambia gemeldet und bestätigen das Vorkommen dieser Art im zentralen südlichen Afrika.

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## 1 Introduction

Through courtesy of W. Schawaller of Staatliches Museum für Naturkunde, Stuttgart, I received a single specimen of the pseudomorphine ground beetle genus *Cryptocephalomorpha* Ritsema for identification which turned out to belong to a new species described herein. Recently R. Ståls of Transvaal Museum, Pretoria, sent me a single specimen of an African pseudomorphine for identification. At the same time, I received another specimen from southern Africa through courtesy of D. Wrase, Berlin. Both specimens are communicated herein.

Pseudomorphinae is a subfamily of ground beetles of quite curious external morphology which rather remind dytiscids or even colydiids, so that they are not easily recognized as carabid beetles. The biology is as well exceptionable, because the species of almost all pseudomorphine genera, except *Cryptocephalomorpha*, are tree-living, mainly occurring under bark or in bark cracks of a variety of tree species. Moreover, the species of several genera are larviparous which means that the larvae already hatch within the female oviducts and are then born. This type of reproduction is extremely rare in beetles and probably is due to the putative myrmecophilous habits of larvae and adults of all genera.

Even within this subfamily, the genus *Cryptocephalomorpha* is unique in its very convex body shape with the mouthparts and legs largely concealed. So far seven species have been recorded most of which occur in South Asia, but one species each in New Guinea, northern Australia, and South Africa. Almost nothing is known about life history, ecological requirements, and behaviour of the species of *Cryptocephalomorpha*, except that the few recorded specimens of the New Guinean species *C. papua* Darlington were collected by ants. Of most species only few or even single specimens have ever been captured, and most samples were done at light. Hence, probably the species of this genus are not regularly tree-living.

[1] 11th supplement to the "Revision of the Pseudomorphinae of the Australian Region".

An extensive diagnosis of the genus, a key to all species known at that time, and complete references to the relevant literature can be found in my monograph (Baehr 1997). One additional species from Borneo was described in Baehr (2002), which paper includes a partly updated key.

Acknowledgements

My sincere thanks are due to Dr. W. Schawaller (Stuttgart), Dr. R. Ståls (Pretoria), and D. Wrase (Berlin) for the kind loan or gift of the material, and to P. Schüle (Herrenberg) for directing my attention to the specimen in the collection in Pretoria. Dr. C. Huber (Bern) and P. Schüle critically reviewed the manuscript.

## 2 Methods and materials

Dissecting methods and measurements follow Baehr (1997).

The holotype of the new species is deposited in Staatliches Museum für Naturkunde, Stuttgart (SMNS). The communicated specimens of *Cryptocephalomorpha genieri* are stored in South African National Collection of Insects, Pretoria (SANC) and in the working collection of the author in Zoologische Staatssammlung, München (CBM).

## 3 Description of *Crytocephalomorpha maxima* n. sp. (Figs. 1, 2)

Holotype (♀): Laos, CE: Boli Kham Xai prov., Ban Nape (8 km NE), 600 m, 18°21'N 105°08'E, leg. Pacholátko, 1.–18.V.2001 (SMNS).

### Etymology

The name refers to the very large size of this species.

### Diagnosis

Distinguished from all other species of *Crytocephalomorpha*, except *C. gigantea* Baehr, 2002, by combination of very large size (in genus), almost circular elytral spots and dark pronotum. From the latter species distinguished by shorter and wider body, in particular shorter elytra, presence of subhumeral and subapical marginal elytral punctures, and slightly explanate lateral margin of elytra.

### Description

Measurements and ratios. Body length: 6.05 mm; body width: 3.1 mm. Width/length of pronotum: 1.72; width of pronotum/width of head: 1.55; length/width of elytra: 1.22; length of elytra/length of pronotum: 2.11.

Colour (Fig. 1). Surface piceous, but pronotum very slightly lighter, anterior margin of head, all margins of pronotum and elytra, and elytral spots light reddish. Reddish lateral margins of pronotum and elytra narrow and inconspicuous, on pronotum the reddish basal margin wide. Apical reddish margin of elytra narrow, suture dark.

**Fig. 1.** *Cryptocephalomorpha maxima* n. sp., habitus. – Scale: 1 mm.

Elytra with a fairly well delimited, slightly elliptical light reddish spot. Lower surface reddish. Mouth parts, antenna and legs dark reddish to piceous, femora reddish, tibiae and tarsi piceous. Whole surface glossy.

Head (Fig. 1). Short and wide, deeply imbedded in prothorax, anterior margin of head moderately convex, border rather convex, far protruding over mouth parts that are completely concealed from above. Frons convex. Clypeus faintly marked by the very superficial clypeal suture. Labrum very small, invisible from above. Mandibles very small, invisible from above, outer margin very gently angulate. Eye oval-shaped, on lower surface of head triangular. Orbit angulate and slightly projected, partly visible from above. Area behind eye asetose. Antennal groove moderately deep, comparatively short, medially and laterally bordered. Mental tooth moderately wide, elongate, obtusely acute, not pointed down. Wings of mentum wide, laminate, apex widely rounded. Glossa large, apparently completely fused with paraglossae to a moderately wide,

tongue-like, far protruding plate with convex apex that is ventrally keeled and rather pointed down. Glossa at apical margin with ca. eight fairly elongate setae, dorsal surface apparently without hairs. Lacinia inconspicuous, almost invisible. Galea narrow and fairly elongate, fusiform. Terminal palpomere of maxillary palpus elongate and almost parallel. Terminal palpomere of labial palpus very large and wide, markedly securiform, apical margin shorter than lateral margin, more than twice as long as inner margin. Both palpi rather densely pilose. Lateral plate of maxilla inconspicuous. Ventral surface of head rather short. Antenna short and wide, depressed, 7th–8th antennomeres more than 1.5 times as wide as long. Microreticulation on dorsal surface present, though extremely fine and somewhat superficial, irregularly isodiametric to slightly transverse, punctures extremely fine and sparse, surface impilose, glossy. Gula impilose.

Pronotum (Fig. 1). Wide, dorsally convex, lateral parts of dorsal surface not perpendicular, therefore lateral margin well visible from above. Base much wider than apex. Apex very convex, extremely finely and superficially margined; apical angles shortly produced, obtusely angulate. Lateral margins gently but evenly convex, finely margined, lateral channel absent, margins not at all explanate. Basal angles distinctly produced backwards, evenly rounded off, base in middle slightly convex, irregularly margined. Surface without median line. Microreticulation present, distinct, extremely fine and superficial, irregularly isodiametric to slightly transverse, surface with extremely fine and sparse, barely perceptible punctures, with some extremely fine, irregular wrinkles, impilose, glossy.

Elytra (Fig. 1). Comparatively short, wide, parallel, very convex, very slightly depressed on disk. Lateral parts not incurved ventro-medially, hence lateral margin visible throughout. Apex wide, truncature evenly convex, slightly incurved towards suture, but not dehiscent, lateral apical angles very widely rounded off. Base wide, obliquely convex, basal angles rounded. Basal margin attaining half of distance to suture, whole base including scutellum usually concealed by base of pronotum. Basal border laterally with a few delicate setae. Marginal channel narrow, well visible, in anterior half even slightly explanate. On left side one marginal puncture, on right side three marginal punctures behind humerus, on both sides a single puncture in front of apical curvature, situated very near lateral margin. Scutellar puncture absent. Dorsal punctures absent. Striae including sutural stria absent. Microreticulation present, very fine, irregularly isodiametric to slightly transverse. Punctures extremely fine and sparse, barely recognizable. Surface rather glossy. Posterior wings fully developed.

Lower surface. Anterior border of prosternum in middle without glandular boss. Prosternal process elongate, far surpassing procoxae, narrow, lower surface in front of coxae impressed, margined inside of procoxae, between coxae very narrow, high, laminate, apex straight, extremely narrow, markedly laminate, surface apparently impilose. Metepisternum elongate, ca. twice as long as wide, posteriorly neither hollowed nor bent. Abdominal sterna bisetose, with coarse, fairly dense punctures and pilosity. Terminal sternum in female quadrisetose, punctate and sparsely pilose, without glandular, densely pilose area. Male terminal sternum unknown.

Legs. Short, first tarsomere of protarsus much longer than wide, tibial groove of profemur deep, symmetric, anterior border almost straight. Femora wide, tibiae rather short, widened towards apex. Metatibia comparatively elongate, ca. 4.5 times as long as wide, first tarsomere of metatarsus more than twice as long as wide. Male protarsus unknown.

Male genitalia. Unknown.

Female genitalia (Fig. 2). Comparatively small, wide. Sternum VIII elongate, apical part rather elongate, triangular, only at tip obtuse, laterally gently angulate, basal process narrow and elongate. Lateral margin of apical part with 4–5 very elongate setae, slightly below tip on upper surface with a tuft of 4–5 shorter setae. Both gonocoxites very narrow and elongate, gonocoxite 1 at apex not widened, gonocoxite 2 spine-shaped, at apex with one fairly elongate seta. Latero-basal angle of basal plate of tergum VIII posteriorly markedly protruding.

Variation. Unknown.

Vivipary. Not confirmed in the examined material.

## Distribution

Laos. Known only from type locality.

## Collecting circumstances

Unknown.

## Relationships

Although *Cryptocephalomorpha maxima* n. sp. at first glance is very similar to the likewise very large *C. gigantea* Baehr from Borneo, actually it is not closely related. On the contrary, several character states in *C. maxima* apparently are quite plesiomorphic, e. g. the elongate tarsomeres and tibiae, in particular the elongate tarsomeres 1 in all legs; the simple outer margin of the mandible; the regular elytra that are not ventrally incurved; the presence of subhumeral and subapical setiferous punctures on the elytra; the presence of setiferous punctures on the abdominal sterna, as well as on the terminal sternum in the female; the elongate apical seta at gonocoxite 2, and the very elongate marginal setae on sternum VIII. In most of these character states *C. maxima* is more plesiomorphic than *C. gigantea* and also more plesiomorphic than all Oriental-Australian species, except *C. gaverei* Ritsema,

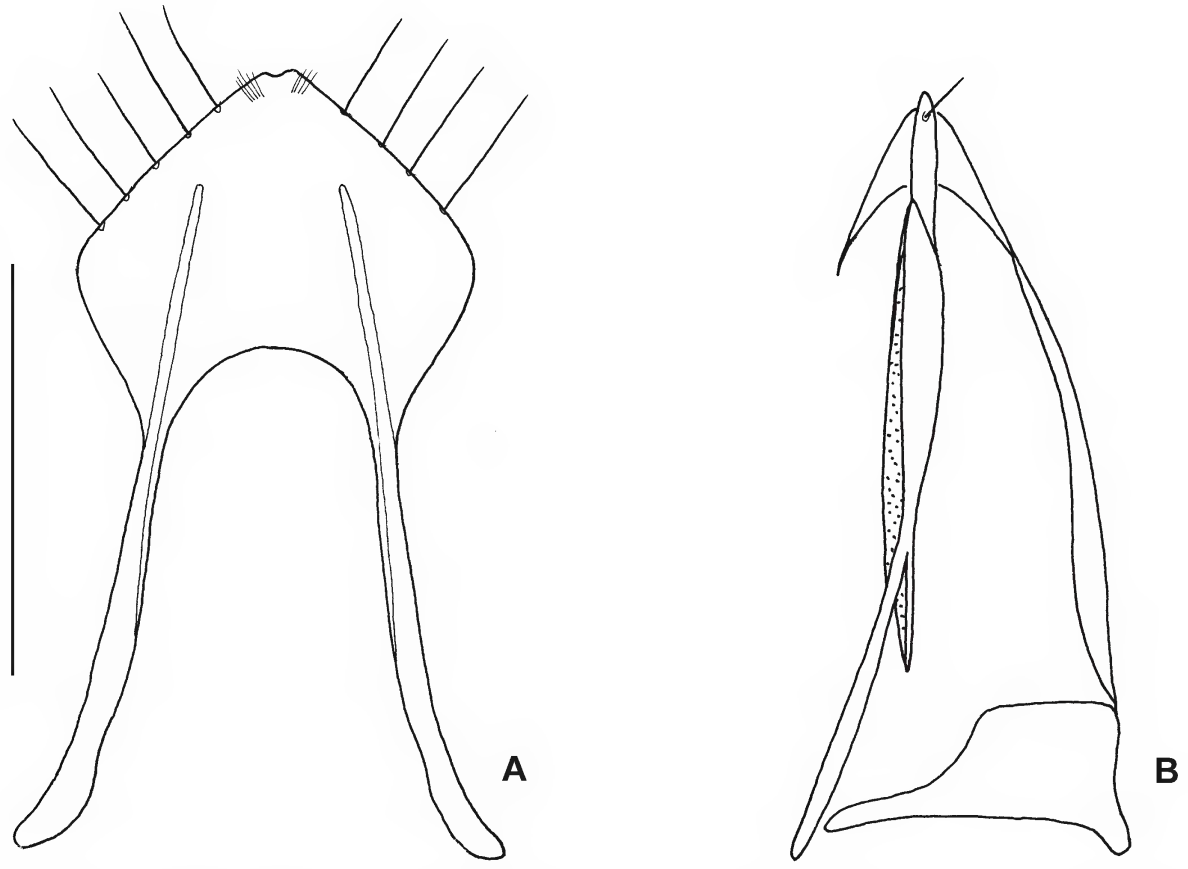


**Fig. 2.** *Cryptocephalomorpha maxima* n. sp., female genitalia, ventral view. – **A**. Sternum VIII. **B**. Gonocoxites 1 and 2, tergum VIII. – Scale: 1 mm.

and likewise except the single African species *C. genieri* Baehr. Apparently *C. maxima* shares many characters with *C. gaverei* with which it may be most closely related. It differs from the latter by much larger size, more circular elytral spot, presence of fine microreticulation on the surface, and presence of short setae at apex of sternum VIII.

## 4 Recognition of *Cryptocephalomorpha maxima* n. sp.

According to the presence of an elytral spot in *C. maxima* the key in my revision (Baehr 1997: 377–378; see also the addition of Baehr 2002: 128) can be followed on to caption 2. This caption then must be altered as following:

**2** Size very large, body length ca. 6 mm. Elytral spot about circular or slightly elliptic and pronotum not contrastingly red. . . . . **2a**
– Size smaller, body length < 5 mm. Either elytral spot clearly oblique or pronotum contrastingly red. . . . . **2b**[= 2 of key in Baehr 1997]
**2a** Elytra longer, ratio length/width ca. 1.3, without any marginal punctures; lateral margin of elytra incurved ventrad, not visible from above; terminal sternum (in female) asetose. – Brunei, Borneo. . . . . ***gigantea*** Baehr
– Elytra shorter, ratio length/width ca. 1.2, with 1–3 marginal punctures near humerus and 1 puncture near apex; lateral margin of elytra slightly explanate laterad, visible from above; terminal sternum (in female) quadrisetose. – Laos. . . . . ***maxima* n. sp.**

## 5 New records of *Cryptocephalomorpha genieri* Baehr, 1997

Through courtesy of Peter Schüle (Herrenberg), Riaan Stâls (Pretoria) and David Wrase (Berlin) I received two pseudomorphine specimens for identification, collected in Botswana and Zambia, southern Africa. Both are females, labelled: "20 km N Maun, Botswana SE, 19, 23, DC, ...[unreadable], 16.I.1978, Holm, Jacobs, Kirsten, Scholtz / National coll. of Insects, Pretoria, S.A." and: "Zambia NC Mkushi env. E. 16.–18.XII.2004, Sniżek, Tichý". They turned out to represent the second and third specimens of *Cryptocephalomorpha genieri* which so far is the single species of the subfamily Pseudomorphinae recorded from Africa (Baehr 1997). The holotype of this

species was from north-western Transvaal close to the Botswana border. The additional specimens considerably enlarge the range of this species which now extends through large parts of central southern Africa. At any rate, the occurrence of a pseudomorphine species in southern Africa is surprising, because this group occurs mainly in Australia and America. Only the aberrant and highly evolved genus *Cryptocephalomorpha* is more common in south-east Asia than in Australia (in terms of species) and through its occurrence in southern Africa it seems to represent a connecting link between the eastern and western pseudomorphine faunas.

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BAEHR, M. (2002): New species and new records of Australian and Oriental Pseudomorphinae – 4th Supplement to the Revisions of the Pseudomorphinae of the Australian Region (Insecta, Coleoptera, Carabidae). – Spixiana **25**: 101–129.

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# New species and additional records of Lomechusini from the Palaearctic region (Coleoptera: Staphylinidae: Aleocharinae)

Volker Assing

Abstract

Ten species of Palaearctic Lomechusini are described and illustrated: *Pella kirgisica* **n. sp.** (Kyrgyzstan), *P. puetzi* **n. sp.** (China: Yunnan), *Tetrabothrus puetzi* **n. sp.** (China: Yunnan), *Amaurodera schuelkei* **n. sp.** (China: Yunnan), *Orphnebius paucisetosus* **n. sp.** (eastern Nepal), *O. scissus* **n. sp.** (China: Yunnan), *O. truncus* **n. sp.** (China: Yunnan), *O. tricuspis* **n. sp.** (China: Yunnan), *Lomechusa gerardiphila* **n. sp.** (Spain: Andalucía), and *Zyras (Termidonia) viti* **n. sp.** (Taiwan). The previously unknown sexual characters of *Orphnebius oculatus* Coiffait, 1982 are described and illustrated. The following synonymies are proposed: *Peltodonia* Bernhauer, 1936, **n. stat.** = *Chaetosogonocephus* Pace, 1987, **n. syn.**; *Peltodonia bodemeyeri* (Bernhauer, 1936) = *Chaetosogonocephus adventicius* Assing, 2004, **n. syn.** The species previously attributed to *Chaetosogonocephus* are moved to *Peltodonia*. The distribution of *P. bodemeyeri* is mapped. Additional records of various Palaearctic Lomechusini species are reported, among them several new country records.

Keywords: Staphylinidae, Aleocharinae, Lomechusini, Palaearctic region, taxonomy, new species, new synonymies, new combinations, distribution, new records, myrmecophily, termitophily.

Zusammenfassung

Zehn Arten der Tribus Lomechusini werden aus der Paläarktis beschrieben und abgebildet: *Pella kirgisica* **n. sp.** (Kirgistan), *P. puetzi* **n. sp.** (China: Yunnan), *Tetrabothrus puetzi* **n. sp.** (China: Yunnan), *Amaurodera schuelkei* **n. sp.** (China: Yunnan), *Orphnebius paucisetosus* **n. sp.** (Ost-Nepal), *O. scissus* **n. sp.** (China: Yunnan), *O. truncus* **n. sp.** (China: Yunnan), *O. tricuspis* **n. sp.** (China: Yunnan), *Lomechusa gerardiphila* **n. sp.** (Spanien: Andalusien) und *Zyras (Termidonia) viti* **n. sp.** (Taiwan). Die bisher unbekannten Sexualmerkmale von *Orphnebius oculatus* Coiffait, 1982 werden beschrieben und abgebildet. Folgende Synonymisierungen werden vorgenommen: *Peltodonia* Bernhauer, 1936, **n. stat.** = *Chaetosogonocephus* Pace, 1987, **n. syn.**; *Peltodonia bodemeyeri* (Bernhauer, 1936) = *Chaetosogonocephus adventicius* Assing, 2004, **n. syn.** Die bisher der Gattung *Chaetosogonocephus* zugeordneten Arten werden in die Gattung *Peltodonia* gestellt. Für *P. bodemeyeri* wird eine Verbreitungskarte erstellt. Weitere Nachweise (darunter mehrere Länder-Erstnachweise) paläarktischer Lomechusini werden gemeldet.

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## 1 Introduction

According to the Palaearctic catalogue (Smetana 2004) and recent articles not included in the catalogue (Assing 2003, 2004a, 2005a–c, 2006b–e, 2007, 2008a, 2008b; Hlaváč 2005a, b; Maruyama 2006a, b; Maruyama & Hlaváč 2004; Maruyama & Kishimoto 2002a, b; Lecoq & Quéinnec 2005; Pace 2004), the Lomechusini are represented in the Palaearctic region by 23 genera and some 250 species. The Lomechusini have received more attention by taxonomists than most other groups of Palaearctic Aleocharinae. Several of the more speciose genera have been comprehensively revised only recently: *Lomechusa* Gravenhorst, 1806 (Palaearctic region) by Hlaváč (2005a), *Amaurodera* Fauvel, 1905 (Palaearctic) by Assing (2003, 2005c, 2006b), *Drusilla* Leach, 1819 (Western Palaearctic, Middle Asia, Japan) by Assing (2002, 2005a, 2005b, 2006a, 2007, 2008b) and Maruyama & Kishimoto (2002a, b), *Orphnebius* Motschulsky, 1858 (Palaearctic) by Assing (2006c, d), *Pella* Stephens, 1835 (Palaearctic) by

MARUYAMA (2006a) and ASSING (2007, 2008a), and *Tetrabothrus* Bernhauer, 1915 (Himalaya) by ASSING (2006e). Apart from most of the Eastern Palaearctic representatives of *Drusilla*, the only larger genera for which comprehensive revisions are still required are *Lomechusoides* (19 valid species in the Palaearctic region), *Myrmoecia* Mulsant & Rey, 1874 (17 species), and especially *Zyras* Stephens, 1835 (86 species).

The foremost reason for the attention that the Lomechusini have attracted is probably that a large proportion of the species are more or less strictly associated with ants or termites, have evolved more or less conspicuous morphological, physiological, and behavioural adaptations, and are consequently of particular interest from a more general biological perspective. However, for a considerable number of species, myrmecophily has not been confirmed and is rather unlikely, since they are usually found without ants. This is at least true of a portion of the *Drusilla* and *Pella* species, although MARUYAMA (2006a) suggests otherwise. It is probably true also of some species in other genera such as *Amaurodera* and *Myrmoecia*.

The present paper is based on material of Lomechusini – predominantly of previously revised genera – that has become available for examination in the past few years. The study not only yielded additional records of zoogeographic interest, but also ten species new to science.

Acknowledgements

My thanks are due to the colleagues indicated in the material section for the loan of material under their care. In particular, I am indebted to MICHAEL SCHÜLKE, Berlin, ANDREAS PÜTZ, Eisenhüttenstadt, LUDGER SCHMIDT, Hannover, and STANISLAV VIT, Genève, for the most generous gift of the holotypes of several species described in this paper. BERNHARD SEIFERT, Görlitz, identified the host ant of *Lomechusa gerardiphila* n. sp. Moreover, I am grateful to CHRISTOPHER MAJKA, Halifax, for stylistic improvement and to BENEDIKT FELDMANN, Münster, and HEINRICH TERLUTTER, Billerbeck, for proof-reading the manuscript.

## 2 Material, methods, and depositories

In all, 269 specimens deposited in the following public institutions and private collections were examined:

| | |
|---|---|
| cAss | author's private collection |
| cFel | private collection B. FELDMANN, Münster, Germany |
| cHir | private collection G. HIRTHE, Damm, Germany |
| cKas | private collection V. KASTCHEEV, Almaty, Kazakhstan |
| cPüt | private collection A. PÜTZ, Eisenhüttenstadt, Germany |
| cRou | private collection G. DE ROUGEMONT, Londinières, France |
| cSch | private collection M. SCHÜLKE, Berlin, Germany |
| cSol | private collection A. SOLODOVNIKOV, Copenhagen, Denmark |
| cVav | private collection J. VÁVRA, Ostrava-Krásné Pole, Czech Republic |
| DEI | Deutsches Entomologisches Institut, Müncheberg, Germany (L. ZERCHE) |
| FMNH | Field Museum of Natural History, Chicago, USA (J. H. BOONE, A. F. NEWTON) |
| MCSNV | Museo Civico di Storia Naturale, Verona, Italy (L. LATELLA) |
| MHNG | Muséum d'Histoire Naturelle, Genève, Switzerland (G. CUCCODORO) |
| NHMW | Naturhistorisches Museum Wien, Austria (H. SCHILLHAMMER) |
| NME | Naturkundemuseum, Erfurt, Germany (M. HARTMANN) |
| SNSD | Staatliche Naturkundliche Sammlungen, Dresden, Germany (O. JÄGER) |

The morphological studies were conducted using a Stemi SV 11 microscope (Zeiss Germany) and a Jenalab compound microscope (Carl Zeiss Jena) with a drawing tube. For the photographs a digital camera (Nikon Coolpix 995) was used. The map was generated using the online generic mapping tool (GMT) of the Geomar website at www.aquarius.ifm-geomar.de/omc.

Head length was measured from the anterior margin of the clypeus (without ante-clypeus) to neck, elytral length at the suture from the apex of the scutellum to the posterior elytral margin.

Labels of type material are cited in their original spelling and language, except for the following adaptations according to the general format requirements of the journal: names of persons (except authors of species) in small capitals, scientific names of genera and species in italics, dates with the months always in Roman numbers.

## 3 Results

### 3.1 Genus *Drusilla* Leach, 1819

Fifty-two *Drusilla* species are currently known from the Palaearctic region. According to recent revisions, 31 species are represented in the Western Palaearctic region and Middle Asia, seven of them in the subgenus *Apteranopsis* Jeannel, 1960 and the remainder in the nominal subgenus (ASSING 2002, 2005a, 2005b, 2006a, 2007, 2008b). There is no confirmed evidence that the Western Palaearctic and Middle Asian species are myrmecophilous. The vast majority of species from the Eastern Palaearctic are unrevised.

#### *Drusilla canaliculata* (Fabricius, 1787)

Additional material examined (total: 40 exs.)

**Spain**: 1 ex., Soria, Puerto de Oncala, 1450 m, 31.V.1999, leg. ASSMANN (cFel).

**Turkey**: **Erzurum**: 2 exs., 30–45 km NE Erzurum, Dumludağı, ca. 40°08'N, 41°24'E, 2200–2500 m, 14.VI.1998, leg. SOLODOVNIKOV (cAss, cSol); 1 ex., 35 km NW Tortum, Mescit Dağları, ca. 40°30'N, 41°25'E, 2100 m, poplar litter, 18.VI.1998, leg. SOLODOVNIKOV (cAss); 1 ex., 40 km NW Tortum, Mescit Dağları, ca. 40°36'N, 41°23'E, 2100 m, pine forest, 20.VI.1998, leg. SOLODOVNIKOV (cAss). – **Gümüşhane**: 1 ex., ca. 50 km SW Trabzon, 9–10 km S Dikkaya, ca. 40°36'N, 39°29'E, 2000 m, 9.VI.1998, leg. SOLODOVNIKOV (cAss).

**Russia**: 7 exs., White Sea area, Kandalakscha Bay, 6.–19. VIII.1991, leg. HIRTHE (cHir, cAss); 2 exs., Tulskaja oblast, Gal-

itsa env., NW Jefremov, 53°09'N, 37°59'E, 24.IV.1986, leg. PÜTZ (cAss, cPüt).

**Georgia**: 3 exs., Likhskiy Khrebet ["Meskisches Gebirge"], leg. LEDER (MCSNV).

**Kazakhstan**: 4 exs., Altai, Marchikha river, 8.VII.1991, leg. KASTCHEEV (cAss, cKas); 6 exs., Almaty, Kaskelen, 28.V.1984, leg. KASTCHEEV (cAss); 3 exs., Dzhungar mt., Aksu river, near Suyksai, 16.VIII.1987, leg. KASTCHEEV (cAss); 4 exs., Dzhungar mt., Keskenterek river, 23.VIII.1987, leg. KASTCHEEV (cAss); 2 exs., Dzhungar Alatau, Golubinovka, 3.VI.1984, leg. KASTCHEEV (cAss); 3 exs., Dzhungar and Kokjota mt., 12.VIII.1987, leg. KASTCHEEV (cAss, cKas).

Comment

Although a macropterous morph is unknown, this trans-Palaearctic species is remarkably widespread. For more records and maps illustrating its distribution in Turkey and Italy see ASSING (2005a, 2005b, 2006a, 2008b).

*Drusilla limata* Assing, 2005

Additional material examined (total: 4 exs.)

**Turkey**: **Antalya**: 2 exs., N Alanya, 5 km W Gündoğmus, 36°49'N, 31°57'E, 980 m, 26.IV.2008, leg. BRACHAT & MEYBOHM (cAss); 1 ex., N Side, Yaylaalan, 36°57'N, 31°30'E, 460 m, 27.IV.2008, leg. BRACHAT & MEYBOHM (cAss). – **Karaman**: 1 ex., Baçyaya, 6 km direction Taşkent, 21.IV.2008, leg. BRACHAT & MEYBOHM (cAss).

Comment

This recently described species was previously known only from two localities in Antalya province, southern Turkey (ASSING 2005a). The spermatheca of the female from Karaman is of slightly different morphology and, in addition, the antennae are darker than is usually the case in *D. limata*. More material is needed to decide if it is indeed conspecific with *D. limata* or if it represents a different species.

*Drusilla recta* Assing, 2005

Additional material examined (total: 2 exs.)

**Turkey**: **Antalya**: 2 exs., 5 km NE Gazipaşa, 36°17'N, 32°22'E, 50 m, 24.IV.2008, leg. BRACHAT & MEYBOHM (cAss).

Comment

The distribution of *D. recta* is confined to Mersin, eastern Antalya, and Konya provinces, southern Anatolia (ASSING 2005a, 2008b).

*Drusilla cernens* Assing, 2005

Additional material examined (total: 7 exs.)

**Israel**: 2 exs., North district, Upper Galilee, Alma plateau, S Alma village, Alma cave environs, 33°02'N, 35°31'E, 630 m, stony pasture, under stones, 9.III.2008, leg. WRASE (cSch, cAss); 2 exs., Upper Galilee, Alma env., cave, 9.III.2008, leg. BUSE (cFel); 1 ex., North district, Upper Galilee, Meron Mts., Nakhar (Wadi) Moran, 1 km W Meron field school, 900 m, leaf litter sifted, 11.III.2008, leg. WRASE (cSch); 2 exs., Upper Galilee, Meron, 8.III.2008, leg. BUSE (cFel).

Comment

The distribution of this species is confined to the Middle East, from central southern Anatolia to Israel, from where it was reported for the first time only recently (ASSING 2005a, 2008b).

*Drusilla alutacea* Reitter, 1901

Additional material examined (total: 6 exs.)

**Kazakhstan**: 2 exs., SE-Kazakhstan, Ile river, splav, Araltobe, 23.VIII.1982, leg. KASTCHEEV (cAss, cKas); 1 ex., Ile river, splav, Karagach, 10.VII.1982, leg. KASTCHEEV (cAss); 2 exs., Ile river, splav, Bakanas, 2.VI.1989, leg. KASTCHEEV (cAss); 1 ex., Balkhash, Karatal river, 1.VII.2004, leg. KASTCHEEV (cAss).

Comment

Previously, only material from Tajikistan and Uzbekistan had been examined (ASSING 2005b). The above specimens represent the first confirmed records from Kazakhstan.

## 3.2 Genus *Pella* Stephens, 1835

According to a recent revision (MARUYAMA 2006a) and subsequent additions (ASSING 2007, 2008a), the genus is represented in the Palaearctic region by 43 species. This figure does not include *Pella pumila* (Fiori, 1914), presumably a junior synonym of *P. similis* (Märkel, 1845), but nevertheless listed as "incertae sedis" by MARUYAMA (2006a). Most species are apparently more or less strictly associated with ants. At least in the Western Palaearctic region there are, however, some species which are usually collected without ants and for which myrmecophily has not been confirmed [e. g. *Pella limbata* (Paykull, 1789)].

*Pella humeralis* (Gravenhorst, 1802)

Additional material examined (total: 6 exs.)

**Turkey**: **Bolu**: 1 ex., Abant Gölü, 1200 m, 4.–23.VI.1996, leg. Vávra (cVav). – **Sinop**: 1 ex., Çangal Dağı, 16.–26.V.1957, leg. Schubert (NHMW); 1 ex., Çangal Dağı, VI.1959, leg. Schubert (NHMW); 1 ex., Çangal Dağı, 8.–16.VII.1961, leg. Schubert (NHMW); 1 ex., Çangal Dağı, V.1962, leg. Schubert (cAss). – **Artvin**: 1 ex., Borçka, 1700 m, 18.–27.VI.1970, leg. Schubert (NHMW).

**Kazakhstan**: 1 ex., Altai, Marchikha river, 8.VII.1991, leg. Kastcheev (cAss).

Comment

In Turkey, the distribution of this common trans-Palaearctic species is confined to the north (Assing 2008a).

*Pella erratica* (Hagens, 1863)

Additional material examined (total: 1 ex.)

**Turkey**: **Sinop**: 1 ex., Çangal Dağı, 8.–16.VII.1961, leg. Schubert (NHMW).

Comment

This rare species is widespread in the Mediterranean and in the southern parts of Central Europe. It is herein reported from Turkey for the first time.

*Pella cognata* (Märkel, 1842)

Additional material examined (total: 2 exs.)

**Turkey**: **Sinop**: 1 ex., Çangal Dağı, 16.–26.V.1957, leg. Schubert (NHMW).

**Russia**: 1 ex., Tulskaja oblast, Jefremov, 53°09'N, 38°07'E, 27.IV.1986, leg. Pütz (cAss).

Comment

*Pella cognata* has a Ponto-Mediterranean distribution ranging to Ukraine, the Baltic countries, Scandinavia, the British Isles, and France. It is herein reported from Turkey and the Russian Central European territory for the first time.

*Pella similis* (Märkel, 1845)

Additional material examined (total: 2 exs.)

**Turkey**: **Kastamonu**: 1 ex., Ilgaz Dağı, leg. Schubert (cAss). – **Karaman**: 1 ex., Ermenek-Gülnar, Moca Geçidi, 36°32'N, 33°00'E, 1420 m, 21.IV.2008, leg. Brachat & Meybohm (cAss).

Comment

The species is widespread, but not very common in the Mediterranean region and in Central Europe. In Turkey, it was previously known from Sinop and Kahramanmaraş provinces (Assing 2004b, 2006f, 2008a; Maruyama 2006a). The above specimen from Karaman was collected from a nest of *Lasius* sp.

*Pella ruficollis* (Grimm, 1845)

Additional material examined (total: 5 exs.)

**Turkey**: **Isparta**: 5 exs., Sütçüler, NE Keşmeköy, 37°28'N, 31°16'E, 1000 m, 14.IV.2008, leg. Brachat & Meybohm (cAss).

Comment

The species has a Ponto-Mediterranean distribution. In Turkey, it was previously known only from Izmir. The above specimens were collected from a nest of *Myrmica* cf. *rubra*.

*Pella limbata* (Paykull, 1789)

Additional material examined (total: 1 ex.)

**Kazakhstan**: 1 ♀, Tarbagata range, 47°14'N, 81°43'E, 1100 m, 27.V.2007, leg. Cooter (cAss).

Comment

The species is widespread and common in Europe and was recorded also from eastern Siberia by Shavrin (2007). It is herein reported from Kazakhstan and Middle Asia for the first time. Maruyama (2006a) states that *P. limbata* may be associated with the ant *Lasius fuliginosus*. Based on the ample collection data available from Europe, especially Central Europe, and on personal observations, however, the species is not strictly associated with any ant species and is generally not found in ant nests. Nevertheless, it seems quite possible that, like *Drusilla canaliculata*, it preys on foraging *Lasius* workers.

*Pella kirgisica* **n. sp.**
(Figs. 1–8)

Type material

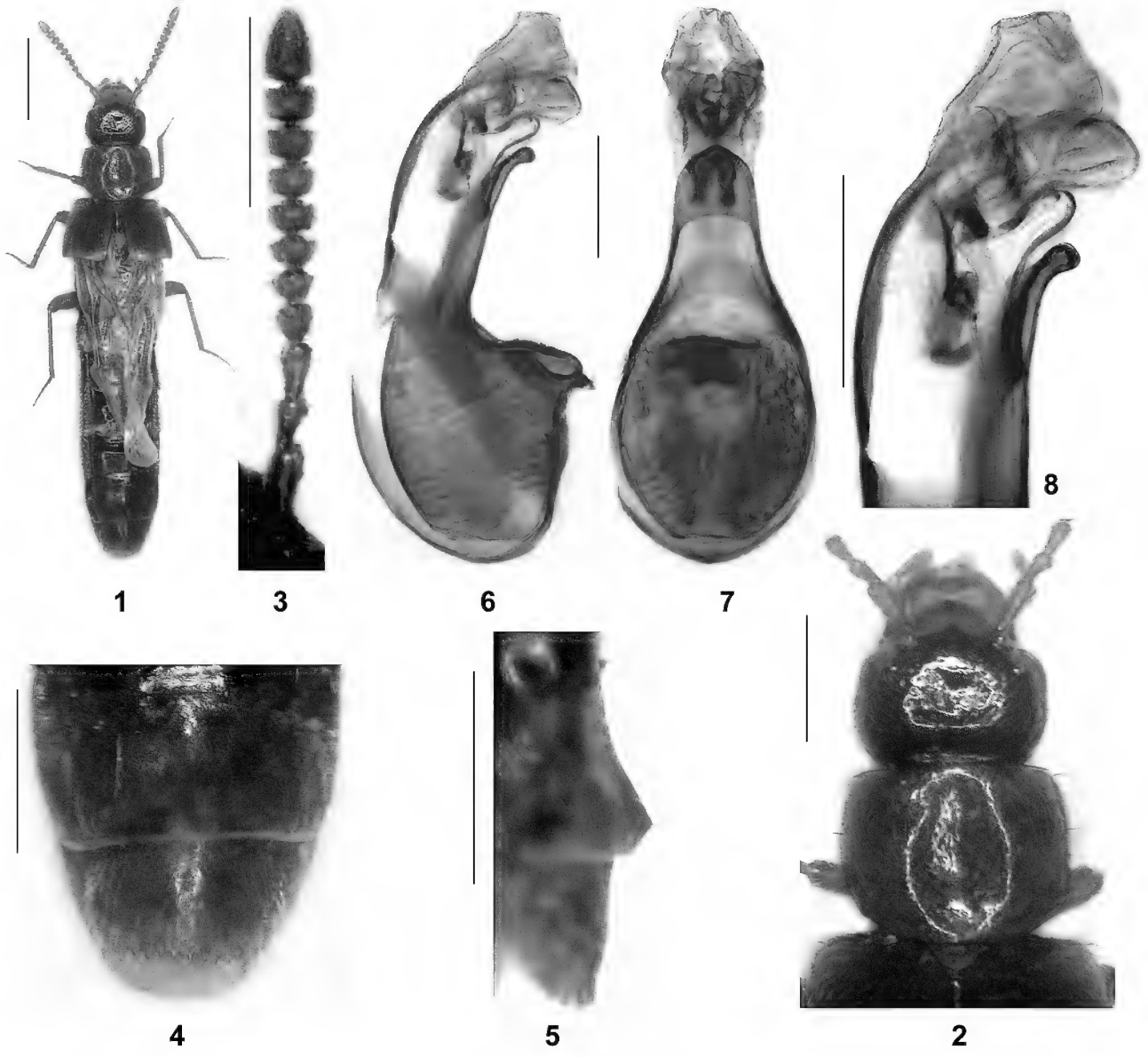
Holotype ♂: "Kyrgyzstan, Tschui, U. Bischkek, Boz Pel'dek, 24.III.2007, N42°45'47", E74°33'51", 1153 m, leg. L. Schmidt / Holotypus ♂ *Pella kirgisica* sp. n. det. V. Assing 2008" (cAss).

Etymology

The name is derived from the ancient name of the region where the type locality is situated.

Description

Body length: 6.2 mm. Habitus as in Fig. 1. Coloration: head and abdomen blackish; pronotum reddish; elytra




**Figs. 1–8.** *Pella kirgisica* n. sp., holotype. – **1**. Habitus. **2**. Head and pronotum. **3**. Antenna. **4**. Male abdominal segments VII–VIII in dorsal view. **5**. Male tergites VII–VIII in lateral view. **6–7**. Median lobe of aedeagus in lateral and in ventral view. **8**. Apex of median lobe of aedeagus in lateral view. – Scale bars: 1.0 mm (1), 0.5 mm (2–5), 0.2 mm (6–8).

dark yellowish with the disc extensively and diffusely infuscate; legs, antennae, and mouthparts reddish.

Head (Fig. 2) approximately 1.15 times as wide as long; punctation in lateral dorsal area rather coarse and moderately dense, with interstices on average approximately as wide as punctures; median dorsal area impressed (sexual dimorphism) and impunctate; pubescence greyish, long, suberect, and directed diagonally postero-mediad; integument with indistinct traces of shallow microsculpture and glossy. Eyes approximately as long as postocular region in dorsal view. Antenna with antennomeres II and III oblong and of subequal length; III moderately transverse and oval-shaped in cross-section; IV approximately 1.5 times as wide as long; V–X approximately twice as wide as long; XI of conical shape, almost as long as combined length of IX and X (Fig. 3).

Pronotum (Fig. 2) 1.25 times as wide as long and 1.18 times as wide as head, widest in anterior half; in the middle with extensive oval impression (sexual dimorphism?); punctation very fine, barely noticeable; pubes-

cence shorter and more depressed than that of head; microsculpture absent; pronotal hypomera visible in lateral view.

Elytra approximately as long as pronotum; punctation moderately dense, more distinct than that of pronotum; pubescence similar to that of pronotum. Hind wings fully developed. Metatarsomere I slightly longer than II, much shorter than combined length of II and III.

Abdomen subparallel, with very sparse and fine punctation and very shallow microsculpture, shiny; posterior margin of tergite VII with pronounced palisade fringe.

♂: tergite VII in posterior half with keel, this keel indistinct anteriorly, its elevation gradually increasing caudad, and pronounced at posterior margin (Fig. 5); tergite VIII with truncate and distinctly denticulate (approximate 15 teeth) posterior margin (Fig. 4); sternite VIII slightly longer than tergite VIII, its posterior margin membranous and weakly convex; median lobe of aedeagus as in Figs. 6–8.

♀: unknown.

### Comparative notes

Based on the external and sexual characters, *P. kirgisica* refers to the *P. excepta* group, which currently includes seven species from the Mediterranean region and Middle Asia (Assing 2008a, Maruyama 2006a). *Pella kirgisica* is readily separated from all these species by the medially impressed and impunctate (male) head, the modifications of the male tergite VII, and by the distinctive shape of the median lobe of the aedeagus, especially by the shape of the apex of the ventral process in lateral view. Five species of the *P. excepta* group have been recorded from Middle Asia and Turkey: *P. cinctipennis* (Eppelsheim, 1884), *P. bohaci* (Dvořàk, 1984), *P. kuluensis* (Cameron, 1939), *P. sultanica* Assing, 2008, and *P. discolor* Assing, 2008. From these species, *P. kirgisica* is additionally distinguished as follows:

from *P. cinctipennis* (Middle Asia, Turkey) by the distinctly bicoloured body, the smaller eyes, the shorter setae at the lateral margins of the pronotum, and the more distinctly denticulate posterior margin of the male tergite VIII;

from *P. bohaci* (Middle Asia) and *P. kuluensis* (Pakistan) by larger body size, the distinctly bicoloured body, smaller eyes, the less transverse pronotum, and the much more strongly denticulate posterior margin of the male tergite VIII;

from the similarly coloured *P. discolor* (Turkey) by more transverse antennomeres IV–X, coarser punctation and longer pubescence of the head, slightly smaller eyes, more distinct punctation of the pronotum, and the median impression of the (male?) pronotum;

from *P. sultanica* (Turkey), whose male sexual characters are unknown, by somewhat smaller size, the more transverse antennomere X, and by a much less transverse pronotum (in *P. sultanica* at least 1.4 times as wide as long) with less distinct punctation.

For illustrations of the above species see Maruyuama (2006a) and Assing (2008a).

### Distribution and bionomics

The type locality is situated in northern Kyrgyzstan, near the town Bishkek. The holotype was collected at an altitude of approximately 1150 m.

## *Pella puetzi* **n. sp.**

(Figs. 9–14)

### Type material

Holotype ♂: "China: Yunnan [CH07-28], Nujiang Lisu Aut. Pref., Gaoligong Shan, side valley 19 km NW Liuku, 25°59'02"N, 98°42'23"E, 2730 m, devast. prim. forest, litter sifted, 9.VI.2007, leg. A. Pütz / Holotypus ♂ *Pella puetzi* sp. n. det. V. Assing 2008" (cAss).

### Etymology

The species is dedicated to Andreas Pütz, Eisenhüttenstadt, specialist of Byrrhidae, who collected the holotype.

### Description

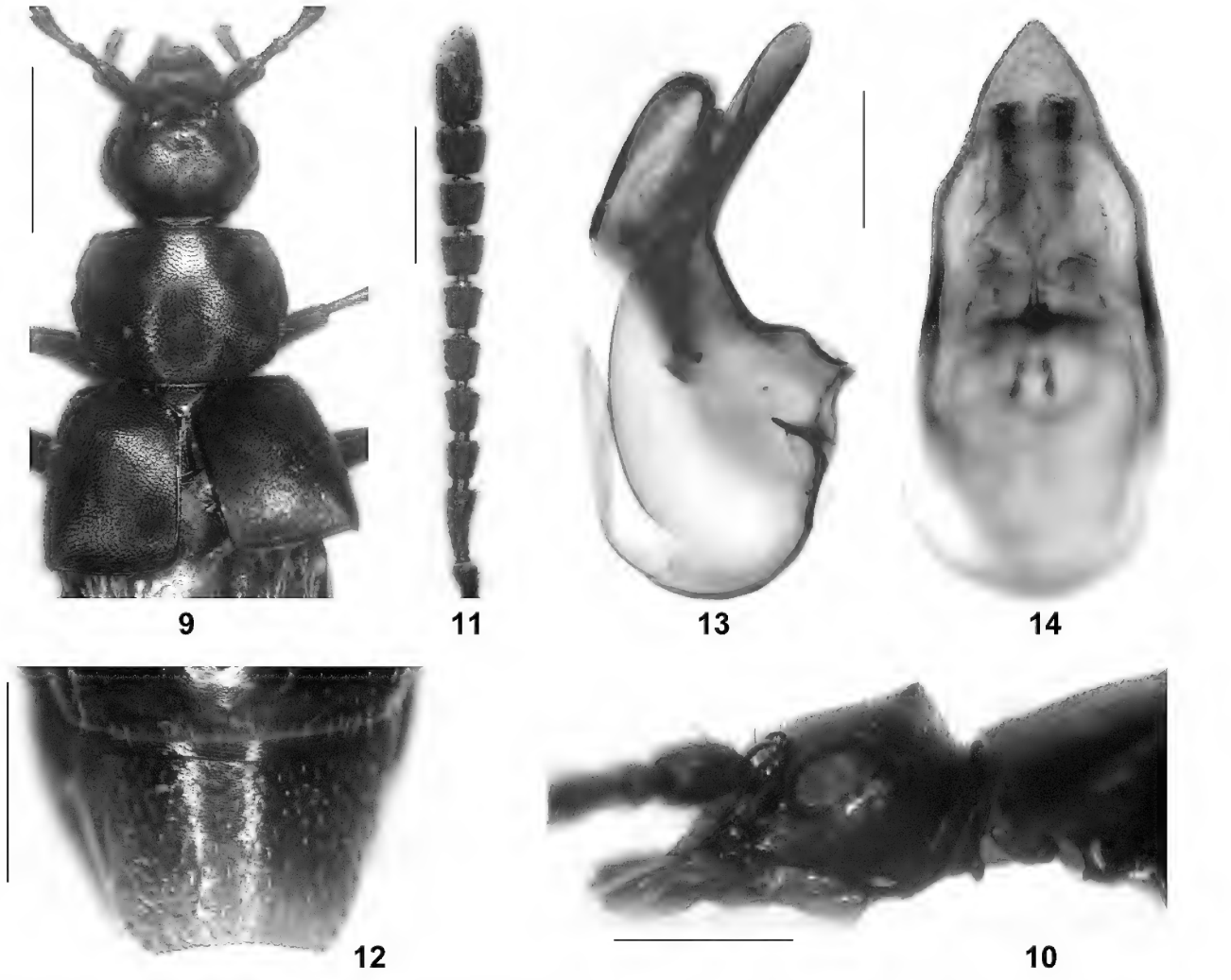
Body length: 8.0 mm. Coloration: head blackish; pronotum and elytra uniformly blackish brown; abdomen blackish, with the posterior margins of the segments reddish brown; femora dark brown; tibiae and tarsi reddish-brown; antennae reddish-brown, with antennomere I blackish.

Head (Fig. 9) almost 1.20 times as wide as long; frons with rather shallow microreticulation and some luster; remainder of dorsal surface with pronounced microreticulation and matt; punctation very fine, barely noticeable within the microsculpture. Eyes slightly longer than postocular region in dorsal view. Antennae long (2.65 mm); antennomere X indistinctly transverse, almost as long as wide; XI approximately as long as I (Fig. 11).

Pronotum (Fig. 9) 1.32 times as wide as long and 1.37 times as wide as head; maximal width approximately at the middle; posterior angles weakly marked, almost obsolete; punctation dense and fine, much more distinct than that of head; interstices with shallow microsculpture and some luster; hypomera fully visible in lateral view.

Elytra approximately 0.95 times as long as pronotum; punctation slightly denser than that of pronotum; microsculpture somewhat more pronounced than that of pronotum. Hind wings fully developed. Metatarsomere I slightly longer than combined length of II and III.

Abdomen with very sparse punctation and shallow transverse microsculpture, shiny; posterior margin of tergite VII with distinct palisade fringe.




**Figs. 9–14.** *Pella puetzi* n. sp., holotype. – **9**. Forebody. **10**. Head in lateral view. **11**. Antenna. **12**. Male tergite VIII in dorsal view. **13**, **14**. Median lobe of aedeagus in lateral and in ventral view. – Scale bars: 1.0 mm (9), 0.5 mm (10–12), 0.2 mm (13–14).

♂: posterior margin of head distinctly angled in the middle (Fig. 10); posterior margin of tergite VIII broadly concave and finely crenulate (Fig. 12); sternite VIII somewhat longer than tergite VIII, its posterior margin membranous and weakly convex; median lobe of aedeagus as in Figs. 13, 14.

♀: unknown.

## Comparative notes

Based on the shape of the pronotum and above all the morphology of the aedeagus the species refers to the *P. cognata* group; according to MARUYAMA (2006a), the only representative of the *P. cognata* group known from China is *P. kishimotoi* Maruyama, 2006. From this species, *P. puetzi* is distinguished by the uniformly blackish to blackish-brown coloration of the forebody, the longer antennae with less transverse antennomeres IV–X, the sexual dimorphism of the head, and the different shape of the ventral process of the aedeagus, especially in ventral view. For illustrations of *P. kishimotoi* see MARUYAMA (2006a).

## Distribution and bionomics

The type locality is situated in the Gaoligong Shan, to the northwest of Liuku in western Yunnan province, China. The holotype was sifted from leaf litter in a degraded primary forest at an altitude of 2730 m.

### 3.3 Genus *Myrmoecia* Mulsant & Rey, 1874

The distribution of this genus is confined to the Western Palaearctic region, where it is represented by 17 species.

#### *Myrmoecia plicata* (Märkel, 1845)

Additional material examined (total: 1 ex.)

**Turkey**: **Adıyaman**: 1 ex., 5 km SW Tut, 11.III.2007 (cAss).

Comment

The general distribution of the rarely found *M. plicata* is of the Ponto-Mediterranean type. In Turkey, it was previously known from three localities in Manisa, Kastamonu, and Muğla (Assing 2006f, 2007).

### 3.4 Genus *Peltodonia* Bernhauer, 1936

*Peltodonia* Bernhauer, 1936: 320 f.
*Chaetosogonocephus* Pace, 1987: 218; **n. syn.**

*Peltodonia* was previously treated as a subgenus of *Zyras* Stephens, 1835 and included only the type species *Zyras bodemeyeri* Bernhauer, 1936 from Turkey. Since this species is evidently not congeneric with *Zyras haworthi* (Stephens, 1832), the type species of *Zyras*, *Peltodonia* is elevated to generic rank.

The genus *Chaetosogonocephus* was originally described to accommodate only the type species (by original designation) *C. rougemonti* Pace, 1987 from Malaysia (Pace 1987). Additional species subsequently attributed to *Chaetosogonocephus* are *C. chinensis* from China (Pace 1998b), *C. adventicius* from Turkey (Assing 2004a), and four taxa recently described from Borneo by Pace (2008): *C. borneensis*, *C. notaticornis*, *C. burckhardti*, and *C. kinabaluensis*.

An examination of the type species of *Peltodonia* and of two species previously attributed to *Chaetosogonocephus* revealed that they are congeneric. Consequently, *Chaetosogonocephus* is here synonymised with *Peltodonia*, and all the species previously in *Chaetosogonocephus* are now in the genus *Peltodonia*.

#### *Peltodonia bodemeyeri* (Bernhauer, 1936), **n. comb.** (Fig. 15)

*Zyras (Peltodonia) bodemeyeri* Bernhauer, 1936: 321.
*Chaetosogonocephus adventicius* Assing, 2004a: 62 ff.; **n. syn.**

Type material examined

Holotype: "v. Bodemeyer, Asia minor, Alhem Dagh / Tars. 4.5.5., 4. Kieftastgld so lang als 3. / Fortsatz der Mittelbrust breit – Hüfte weit getrennt / Gen. nov. sp. nov. / *Bodemeyeri* Brnh. Typus unic. *Peltodonia* / Chicago NHMus M. Bernhauer Collection" (FMNH). – The examination of the holotype is based on photographs of the holotype specimen and the labels kindly made available to me by J. H. Boone (FMNH).

Additional material examined (total: 4 exs.)

**Turkey**: **Antalya**: 1 ex., N Kumluca, Altınyaka, 24.V.1991, leg. Schönmann & Schillhammer (NHMW); 1 ex., Köprü valley, Çaltepe, 37°19'N, 31°11'E, 430 m, 14.IV.2008, leg. Brachat & Meybohm (cAss). – **Konya**: 1 ex., Akşehir env., "Tekketal", 28.IV.1960, leg. Ressl (NHMW); 1 ex., Akşehir env., Sultan Dağları, 25.IV.1960, leg. Ressl (cAss).

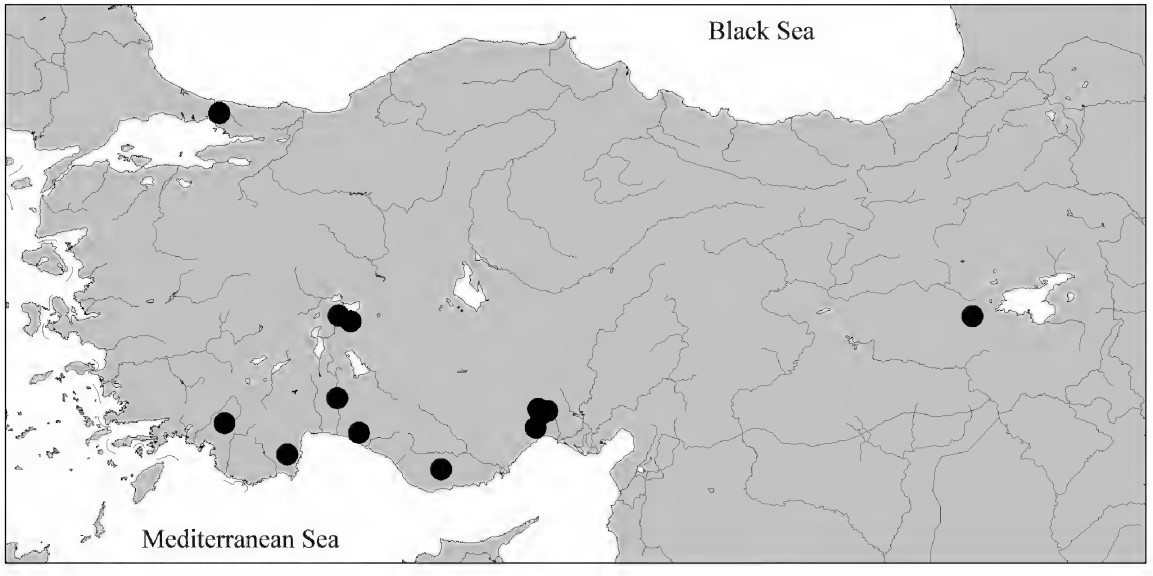



**Fig. 15.** Distribution of *Peltodonia bodemeyeri* (Bernhauer) in Turkey.

Comment

The original description of *Zyras bodemeyeri* is based on a single holotype specimen from the "Alhem Dagh", Istanbul province (Bernhauer 1936). An examination of this holotype revealed that it is conspecific with the type material of the recently described *Chaetosogonocephus adventicius* Assing.

Distribution and bionomics

*Peltodonia bodemeyeri* has been recorded only from Turkey, where it is apparently rather widespread (Fig. 15). The species has been recorded from Istanbul, Denizli, Antalya, Konya, Mersin, and Bitlis provinces. For previous records see Assing (2004a, 2004b, 2006f).

The bionomics of this species are still unclear. It has been collected – mostly as single individuals – in various habitats such as forests (*Quercus*, *Carpinus*) and flood plains at a wide range of altitudes (50–1700 m), from sifted leaf litter and under stones, especially in April and May, but also in July and November. There is no evidence of an association with ants.

*Peltodonia chinensis* (Pace, 1998)

Additional material examined (total: 3 exs.)

**China**: 3 exs., Zhejiang, Tianmu Shan, pass 25 km NNW Linan, 30°26'N, 119°36'E, 620–820 m, creek valley with bamboo and mixed forest, litter sifted, 16.VI.2007, leg. Schülke & Wrase (cSch, cAss).

Comment

The original description is based on a single female from the Tianmu Shan (Pace 1998b). This is the second record of the species.

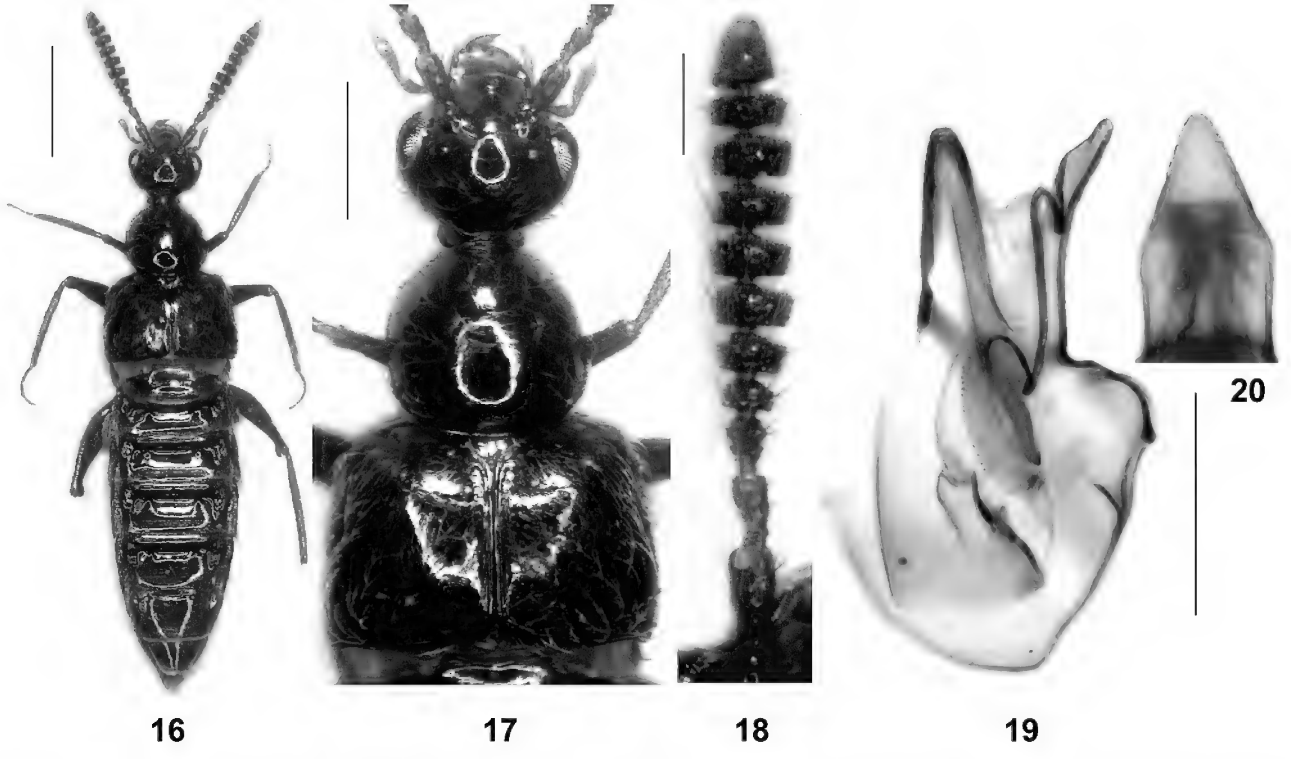
3.5 Genus *Tetrabothrus* Bernhauer, 1915

In the Palaearctic region, *Tetrabothrus* was previously represented by nine species, all of which are distributed in the Eastern Palaearctic (Assing 2006e, Smetana 2004). The Himalayan species were recently revised (Assing 2006e).

*Tetrabothrus puetzi* **n. sp.**
(Figs. 16–20, 32)

Type material

Holotype ♂: "China: Yunnan [CH07-25], Nujiang Lisu Aut. Pref., Salween side valley 5 km S Fugong, road SS 228 km 223, under stones, moist embankment, 8.VI.2007, leg. A. Pütz / Holotypus ♂ *Tetrabothrus puetzi* sp. n. det. V. Assing 2008" (cAss).




**Figs. 16–20.** *Tetrabothrus puetzi* n. sp., holotype. – **16**. Habitus. **17**. Forebody. **18**. Antenna. **19**. Median lobe of aedeagus in lateral view. **20**. Ventral process of median lobe of aedeagus in ventral view. – Scale bars: 1.0 mm (16), 0.5 mm (17), 0.2 mm (18–20).

Etymology

The species is dedicated to my friend and colleague ANDREAS PÜTZ, Eisenhüttenstadt, who collected the holotype.

Description

Body length: 5.3 mm. Habitus as in Fig. 16. Coloration: forebody castaneous brown, with the anterior part of the head and the anterior part of the elytra (between humeral angles and scutellum) paler, reddish-brown; abdomen dark reddish; legs reddish to reddish-brown, with the profemora darker brown; antennae dark brown, with the basal three antennomeres reddish; mouthparts reddish.

Head (Fig. 17) approximately 1.15 times as wide as long; neck approximately 0.3 times as wide as maximal head width; integument with sparse and very fine punctation, with long whitish pubescence, without microsculpture, and distinctly glossy. Eyes large and almost as long as postocular region. Antennae not distinctly asymmetric, massive; antennomeres IV–X strongly transverse, at least 3 times as wide as long; XI short and small, distinctly narrower than X (Fig. 18).

Pronotum (Fig. 17) strongly convex in cross-section, approximately as wide as long and 1.1 times as wide as head; lateral margins subparallel in dorsal view; whole surface with sparse and extremely fine punctation and with long suberect to erect, whitish to yellowish pubescence; lateral margins without long stout setae; microsculpture absent, surface with pronounced luster.

Elytra 1.52 times as wide and at suture 0.83 times as long as pronotum (Fig. 17); punctation sparse and fine, but less so than that of head and pronotum; microsculpture absent; pubescence suberect to erect, long, whitish to yellowish. Hind wings fully developed. Legs slender; metatibia weakly curved.

Abdomen widest at segments IV–V, segments VI–VIII gradually tapering posteriad; integument without microsculpture and with pronounced luster (Fig. 32); tergites impunctate, except for two pairs of setiferous punctures at the posterior margins of tergites III–VI, one pair of setiferous punctures on tergite VII, and several setiferous punctures near the posterior margin of tergite VIII.

♂: tergite VIII with broadly convex posterior margin; sternite VIII longer than tergite VIII, its posterior margin strongly convex (Fig. 32); median lobe of aedeagus as in Figs. 19, 20.

♀: unknown.

Comparative notes

The only *Tetrabothrus* species previously known from China is *T. rougemonti* Pace 1998. From this species, *T. puetzi* is separated by darker coloration of the forebody (in *T. rougemonti* reddish) and of the legs (femora in *T. rougemonti* yellowish with brownish apices), and by the different shape of the median lobe of aedeagus (ventral process in *T. rougemonti* much shorter and broader). *Tetrabothrus bicolor* Cameron, 1939 from Burma is distinguished from the new species by different coloration (blackish forebody, blackish legs with reddish tarsi, uniformly blackish antennae), the absence of punctures in the median dorsal area of the head, a transverse pronotum, and the absence of punctures along the middle of the pronotum. For illustrations of *T. rougemonti* see PACE (1998b), for a key to the *Tetrabothrus* species of the Himalayan region see ASSING (2006e).

Distribution and bionomics

The type locality is situated near Fugong in western Yunnan province, China. The holotype was found near a river bank under a stone.

### 3.6 Genus *Amaurodera* Fauvel, 1905

In the Palaearctic region, *Amaurodera* was previously represented by 18 species, all of which are distributed in the Eastern Palaearctic (ASSING 2003, 2005c, 2006b; SMETANA 2004). The Himalayan species were recently revised (ASSING 2003, 2005c, 2006b).

*Amaurodera veluticollis* (Motschulsky, 1858)

Additional material examined (total: 2 exs.)

**India**: 2 exs., Arunachal Pradesh, Along, 30.V.2006, leg. DE ROUGEMONT (cRou, cAss).

Comment

The species is widespread in the Himalaya and in the Oriental region. It is here reported from Arunachal Pradesh for the first time.

*Amaurodera silvana* Pace, 1992

Additional material examined (total: 7 exs.)

**Nepal**: 7 exs., Annapurna, Myagdi district, Ghorepani, 3200 m, 21.–23.III.1994, leg. AHRENS (DEI, cAss).

Comment

The distribution of *A. silvana* is confined to the Annapurna and Dhaulagiri Himal in central Nepal, where the species is apparently rather common (ASSING 2003, 2005c, 2006b).

*Amaurodera coriacea* Assing, 2003

Additional material examined (total: 63 exs.)

**Nepal**: 14 exs., Manaslu, E-slope of Ngali Khola valley, 28°22'N, 84°29'E, 2000–2300 m, 15.V.2005, leg. SCHMIDT (NME,

cAss); 40 exs., Manaslu, E-slope of Ngali Khola valley, 28°22'N, 84°30'E, 2800–3000 m, 13.V.2005, leg. SCHMIDT (NME, cAss); 9 exs., W-Manaslu, Ngadi Khola region, below Bara Pokhari Lekh, 28°22'N, 84°30'E, 2800 m, 12.–13.V.2005, leg. JÄGER (SNSD, cAss).

### Comment

The species is apparently endemic to the Manaslu range in central Nepal (ASSING 2003, 2005c).

## *Amaurodera bomfordi* (Eppelsheim, 1890)

Additional material examined (total: 23 exs.)

**Nepal**: 10 exs., Manaslu, E-slope of Ngali Khola valley, 28°22'N, 84°29'E, 2000–2300 m, 15.V.2005, leg. SCHMIDT (NME, cAss); 4 exs., Manaslu, Bara Pokhari Leak, above Bhachok Goan vill., 28°14'N, 24°25'E, 1600–1800 m, 29.IV.2005, leg. SCHMIDT (NME, cAss).

**India**: **Uttarranchal state**: 8 exs. [partly teneral], Nainital, China peak env., 1900–2300 m, 18.–19.VII.2003, leg. KEJVAL & TRÝZNA (NHMW, cAss); 1 ex., 30 km N Bageshwar, W Loharket vill., 1800–1900 m, 24.VI.2003, leg. KEJVAL & TRÝZNA (NHMW).

### Comment

In the Himalayan region, *A. bomfordi* is one of the most widespread and common species of the genus (ASSING 2003, 2005c, 2006b). Some specimens collected in July (Uttarranchal state) are teneral. For a distribution map see ASSING (2006b).

## *Amaurodera soror* Cameron, 1939

Additional material examined (total: 4 exs.)

**Nepal**: 1 ex., Annapurna, S Ghorepani, Ulleri, 2000 m, 16.VI.1993, leg. SCHMIDT (DEI); 1 ex., Dhaulagiri, S-slope, upper Ruhagat Khola between Chima Khola and Dwari, 1750 m, 10.V.2002, leg. SCHMIDT (NME); 1 ex., Mahakali prov., Latinath, 29°44'N, 80°46'E, 1100 m, river bank, 2.VI.2005, leg. WEIPERT (NME); 1 ex., Mechi prov., N Phidim, bridge at Hinwa Khola, 27°10'N, 87°46'E, 620 m, 29.III.2003, leg. WEIPERT (cAss).

### Comment

Like the closely related *A. bomfordi*, *A. soror* is widespread in the Himalayan region, but it has been collected more rarely (ASSING 2003, 2005c, 2006b). For a distribution map see ASSING (2006b).

## *Amaurodera schuelkei* n. sp.
(Figs. 21–31)

### Type material

H o l o t y p e ♂: "China: Yunnan [CH07-17], Baoshan Pref., mountain range 25 km S Tengchong, 1900 m, 24°48'28"N, 98°32'03"E, dev. primery [sic] decid. forest, litter, fungi sifted, 2.VI.2007, M. SCHÜLKE / Holotypus ♂ *Amaurodera schuelkei* sp. n. det. V. ASSING 2007" (cAss).

P a r a t y p e s : 1 ♀ [slightly teneral]: same data as holotype (cSch); 1 ♂: same data, but leg. A. PÜTZ (cPüt).

### Etymology

The species is dedicated to my friend and colleague MICHAEL SCHÜLKE, Berlin, who collected two of the type specimens.

### Description

Body length: 5.8–6.2 mm. Habitus as in Fig. 21. Coloration: forebody, posterior margins of abdominal segments III–IV, and abdominal tergites V–VII dark brown; anterior parts of abdominal segments III–IV, most of the paratergites, posterior margins of segments V–VII, and segment VIII reddish; legs pale reddish-yellow, with the apical halves of the femora slightly darker; antennae reddish-yellow, with at least antennomeres IV–VII and apical half of III darker.

Head (Figs. 22, 23) slightly (ca. 1.05×) longer than wide; punctation sparse and rather fine; integument with very shallow microreticulation and glossy; eyes bulging, slightly longer than half the length of postocular region in dorsal view. Antennae very long and slender, approximately 3.5 mm long, reaching posterior margin of abdominal segment IV (Fig. 24).

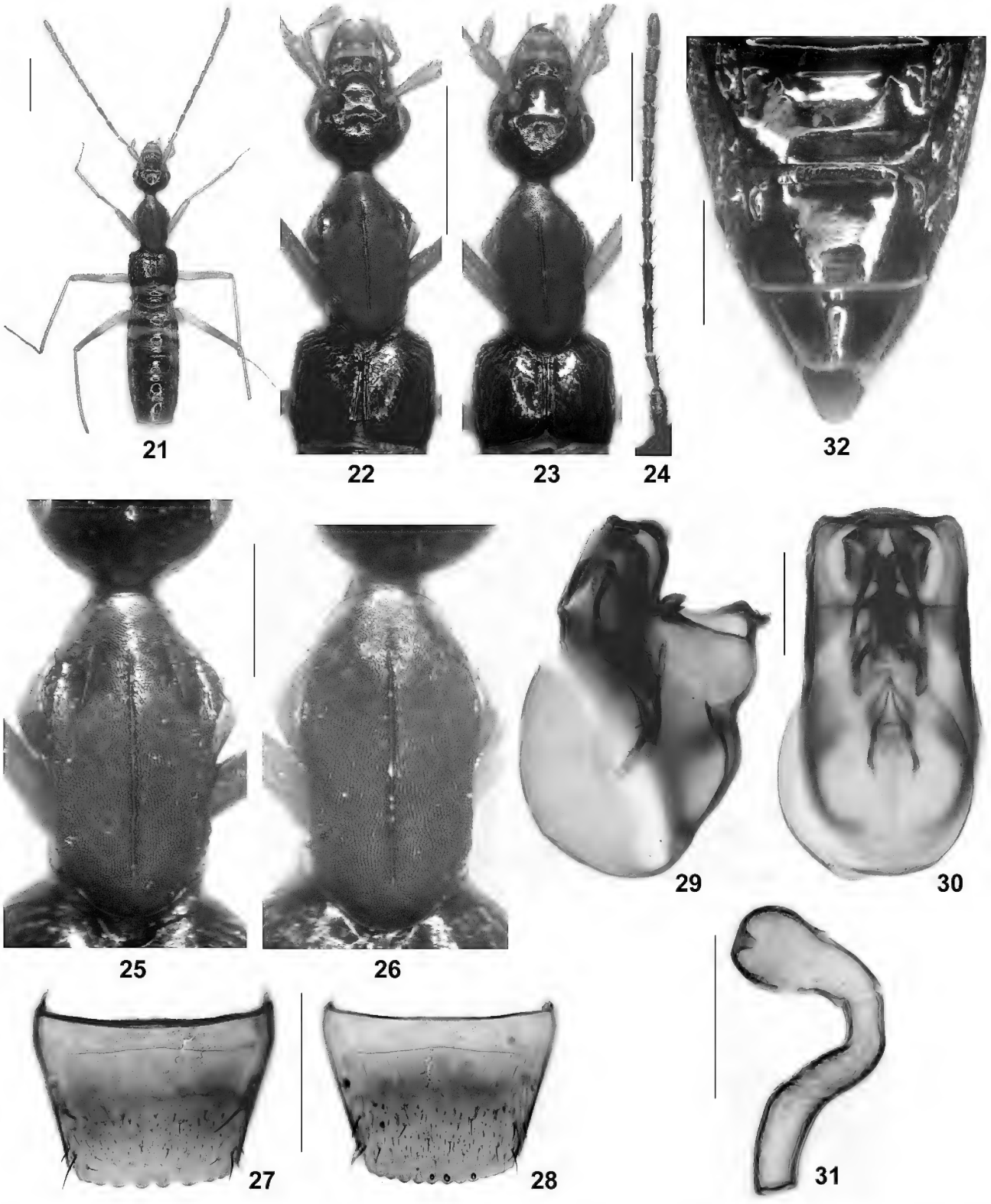
Pronotum approximately 1.2 mm long, with pronounced sexual dimorphism (Figs. 25, 26); dorsal surface in posterior ⅔ with pronounced microreticulation and matt, in anterior ⅓ with shallower microreticulation and subdued luster; median sulcus deep and narrow, not reaching anterior and posterior margins.

Elytra short, at suture only approximately 0.45 times as long as pronotum (Figs. 22, 23); dorsal surface with fine and sparse punctation, with sparse and depressed whitish pubescence, with extremely shallow microreticulation (visible only at higher magnification), and distinctly glossy. Legs very long and slender (Fig. 21).

Abdomen slightly wider than elytra, widest at segments IV and V; punctation fine and very sparse; integument with extremely shallow, barely noticeable microsculpture and distinctly glossy; posterior margin of tergite VII with palisade fringe.

♂: pronotum anteriorly on either side with rather pronounced elevated carina with five stout blackish setae and, mediad of this carina, with additional weakly elevated carina, area between these carinae with shallow microsculpture and some luster (Figs. 22, 25); posterior margin of tergite VIII truncate and distinctly serrate (Fig. 27); posterior margin of sternite VIII truncate; median lobe of aedeagus rather massive, 0.7 mm long, of distinctive morphology, in ventral view of subrectangular shape (Figs. 29, 30).

♀: pronotum anteriorly on either side sharply edged, but without carinae (Figs. 23, 26); posterior margin of




**Figs. 21–32.** *Amaurodera schuelkei* n. sp. (21–31) and *Tetrabothrus puetzi* n. sp. (32). – **21**. Female habitus. **22**. Male forebody. **23**. Female forebody. **24**. Antenna. **25**. Male pronotum. **26**. Female pronotum. **27**. Male tergite VIII. **28**. Female tergite VIII. **29**, **30**. Median lobe of aedeagus in lateral and in ventral view. **31**. Spermatheca. **32**. Abdominal segments VI–VIII. – Scale bars: 1.0 mm (21–24), 0.5 mm (25–28, 32), 0.2 mm (29–31).

tergite VIII more finely serrate than in ♂ (Fig. 28); sternite VIII weakly convex posteriorly; spermatheca as in Fig. 31, duct truncate proximally.

Comparative notes

The species evidently belongs to the *A. bomfordi* species group, as can be inferred from several synapomorphies: the sexual dimorphism of the pronotum, the stout and in lateral view broadly truncate median lobe of the aedeagus, as well as the proximally truncate spermatheca (see Assing 2003). The *A. bomfordi* group previously comprised eight species distributed in the Himalaya and adjacent regions, only two of which are widespread (Assing 2003, 2005c). From all of them, the new species is particularly distinguished by the shape of the median lobe of the aedeagus and the modifications of the male pronotum. From the widespread *A. bomfordi* and *A. soror*, it is additionally separated by the longer and more slender antennae, from *A. soror* also by longer legs, the much shallower microsculpture of the head and elytra (in *A. soror* pronounced, integument matt), the much sparser punctation of the elytra (in *A. soror* very dense), and the distinctly paler coloration of the abdomen and legs (in *A. soror* abdomen almost uniformly dark brown to blackish brown and apical halves of femora blackish brown). For illustrations of the external and sexual characters of the Himalayan *Amaurodera* species see Assing (2003, 2005c, 2006b).

Only two species of *Amaurodera* were previously known from China, both of them reported only from Yunnan province: *A. yaoana* Pace, 1992, which was originally described from Thailand (Pace 1992a) and later also recorded from Yunnan (Pace 1998a), and *A. yunnanensis* Pace, 1998, which has been recorded only from western Yunnan province (Pace 1998b). Based on the illustrations of the habitus and the genitalia by Pace (1992a, 1998b), neither of these species refers to the *A. bomfordi* group.

Distribution and bionomics

The type locality is situated near Tengchong (China: western Yunnan). The type specimens were sifted from the litter of a deciduous forest at an altitude of 1900 m. The female paratype is slightly teneral.

*Amaurodera martensi* Coiffait, 1982

Additional material examined (total: 30 exs.)

**Nepal**: 30 exs., Kathmandu, Shivapuri Lekh, slope W of Bagmati river, 2000–2300 m, 22.–23.V.2005, leg. Schmidt (NME, cAss).

Comment

The species has been recorded from several localities in central Nepal and from the Rolwaling Himal in eastern Nepal (Assing 2003, 2005c, 2006b).

*Amaurodera cameroni* Assing, 2003

Additional material examined (total: 1 ex.)

**Nepal**: 1 ex., Mahakali prov., Darchula distr., NE Gamla, Chamaliya Khola, 29°42'N, 80°42'E, 850 m, river margin, 31.V.2005, leg. Hartmann (NME).

Comment

The previously known distribution of *A. cameroni* included northern India, as well as central and eastern Nepal (Assing 2003, 2005c). The above specimen represents the first record from western Nepal.

3.7 Genus *Orphnebius* Motschulsky, 1858

*Orphnebius* currently comprises some 120 species worldwide, most of which are distributed in the tropics, especially in the Oriental and Neotropical regions (Assing 2006c, 2006d; Pace 2007). According to a recent revision (Assing 2006c, 2006d), the genus is represented in the Palaearctic region by 22 species, all of them distributed in the Himalayan region and China. A reliable identification of most species is possible only based on the male sexual characters.

*Orphnebius hauseri* Eppelsheim, 1895

Additional material examined (total: 1 ex.)

**Nepal**: 1 ♂, Karnali prov., Jumla distr., 2 km W Churta, 2900 m, stream bank, 4.V.1995, leg. Hartmann (cAss).

Comment

Owing to frequent previous confusion with similar species, the distribution of *O. hauseri* is still somewhat unclear. Confirmed records were previously known only from Himachal Pradesh (Assing 2006c). The above specimen represents the first verified record from Nepal.

*Orphnebius appendiculatus* Assing, 2006

Additional material examined (total: 1 ex.)

**Nepal**: 1 ♂, Arun Valley, Mure, 2050 m, leg. Probst (NHMW).

Comment

The species was known only from central Nepal (Assing 2006c). The above specimen represents the first record from eastern Nepal.

## *Orphnebius oculatus* Coiffait, 1982
(Figs. 33–37)

Additional material examined (total: 4 exs.)

**India**: 3 ♂♂, 1 ♀, Himachal Pradesh, Katrain near Kulu, leg. Franz [Pa 358] (NHMW, cAss).

### Comment

The original description is based on a single holotype specimen from central Nepal (Coiffait 1982), which was studied earlier (Assing 2006c). The abdomen of the holotype is missing, so that the sexual characters of this species were previously unknown. An examination of the above material yielded no significant external characters separating it from the holotype of *O. oculatus* (Figs. 33, 34). Therefore, they are here hypothesised to be conspecific. Nevertheless, in view of the distance between the type locality in central Nepal and the surroundings of Kulu in Himachal Pradesh, the possibility that the above specimens may represent a distinct species cannot be ruled out completely.

The female listed above had been dissected prior to the present study and is additionally labelled as follows: "Holotypus *Orphnebius franzi* mihi, det. R. Pace 1983 / *Orphnebius franzi* n. sp. det. R. Pace 1983". A description pertaining to this specimen was never published. Pace (1985) attributed the name *Orphnebius franzi* to a species from Venezuela.

### Description of the sexual characters

♂: median lobe of aedeagus 0.75–0.80 mm long with relatively short and straight ventral process (lateral view) of triangular shape (ventral view), and with relatively broad crista apicalis in lateral view (Figs. 35, 36); paramere with rather stout condylite and with paramerite of distinctive shape and chaetotaxy (Fig. 37).

♀: primary and secondary sexual characters highly similar to those of *O. hauseri*.

### Comparative notes

The species is readily distinguished from other species of similar coloration by the morphology of the paramere, as well as by the shape of the median lobe of the aedeagus; from the sympatric *O. hauseri* and *O. jumlaicus* also by the uniformly yellowish-brown legs, the large eyes, and the morphology of the antennae.

### Distribution

The species is known only from central Nepal and from the surroundings of Kulu, Himachal Pradesh, from where *O. hauseri* and *O. jumlaicus* have also been recorded.

## *Orphnebius paucisetosus* **n. sp.**
(Figs. 38–46)

### Type material

Holotype ♂: "Nepal Mechi/Taplejung, 20 km NEE [sic] Taplejung, env. Phumphe, 1850 m, 27°24'28"N, 87°51'46"E, 24.V.2003, leg. A. Weigel / Holotypus ♂ *Orphnebius paucisetosus* sp. n. det. V. Assing 2008" (NME).

### Etymology

The name (Latin, adjective: with few setae) refers to the distinctive chaetotaxy of the pronotum.

### Description

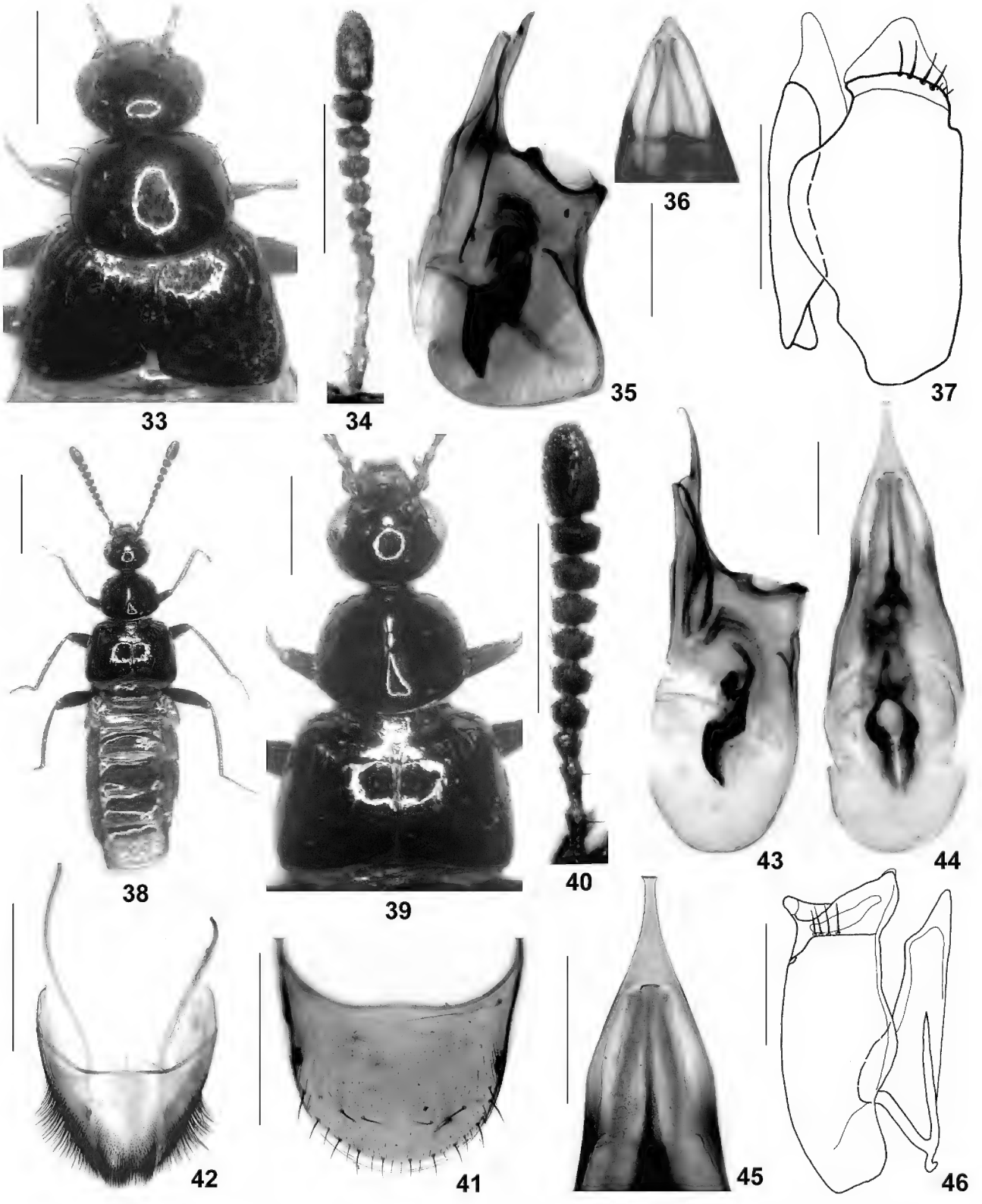
Body length: 4.7 mm. Habitus as in Fig. 38. Coloration: forebody black; abdomen bright pale reddish; legs with the femora blackish, tibiae dark brown, tarsi reddish-brown; antennae blackish, with antennomeres II–III slightly paler dark brown.

Head distinctly transverse, approximately 1.25 times as wide as long, posteriorly vertically sloping ventrad towards neck, but not angulate; posterior margin of head between posterior margins of eyes in dorsal view smoothly and moderately convex, i. e., posterior angles completely obsolete; neck approximately 0.3 times as wide as head; punctation extremely fine and sparse, punctures present only in lateral and posterior areas, median dorsal area impunctate; microsculpture absent. Eyes very large and bulging, somewhat longer than postocular region (from posterior margin of eye to neck) in dorsal view (Fig. 39). Antenna moderately asymmetric; antennomeres IV weakly transverse, V–X strongly transverse; X approximately twice as wide as long; XI almost as long as combined length of VIII–X (Fig. 40).

Pronotum rather weakly convex in cross-section, slightly depressed on either side of midline, distinctly transverse, 1.25 times as wide as long and 1.25 times as wide as head; maximal width in posterior half, posterior angles almost obsolete; disc impunctate, punctation present only at margins; near anterior angles with few black setae; lateral margins without black setae; areas near lateral margins with some pale brownish setae (Fig. 39).

Elytra nearly 1.60 times as wide and at suture approximately 0.8 times as long as pronotum, distinctly widened posteriad (Fig. 39); punctation very sparse and fine; microsculpture absent; pubescence suberect to depressed, long, and whitish. Hind wings fully developed. Legs long and slender; metatarsomere I approximately as long as combined length of II–III.

Abdomen widest at segments III–V, gradually tapering posteriad; integument without microsculpture; paratergites of segments III–V sharply edged and strongly elevated; tergites III–VI impunctate except for four setiferous punctures at posterior margins of tergites IV–VI; tergite VII, except for area near anterior and posterior mar-




**Figs. 33–46.** *Orphnebius oculatus* Coiffait (Himachal Pradesh) (33–37) and *O. paucisetosus* n. sp. (38–46). – **33**, **39**. Forebody. **34**, **40**. Antenna. **35**, **43**. Median lobe of aedeagus in lateral view. **36**, **45**. Ventral process of median lobe of aedeagus in ventral view. **37**, **46**. Paramere. **38**. Habitus. **41**. Male tergite VIII. **42**. Male abdominal segments IX–X. **44**. Median lobe of aedeagus in ventral view. – Scale bars: 1.0 mm (38), 0.5 mm (33–34, 39–42), 0.2 mm (35–37, 43–46).

gins, with oblong punctures, near posterior margin with row of short setae; posterior margin of tergite VII with distinct palisade fringe; tergite VIII impunctate, except for two rows of submarginal and marginal punctures bearing black setae (Fig. 41).

♂: segments IX–X modified, with dense and long black pubescence (Fig. 42); median lobe of aedeagus approximately 1.0 mm long and slender, with long, slender, and apically very acute ventral process (Figs. 43–45); paramere with rather massive condylite, paramerite apically of distinctive shape, with four subapical setae (Fig. 46).

♀: unknown.

### Comparative notes

Based on external features (chaetotaxy of pronotum, asymmetric antennae, morphology and chaetotaxy of abdomen, distinctly bicoloured body) and sexual characters (modifications of male segments IX–X, morphology of median lobe of aedeagus, shape of paramere), the species doubtlessly belongs to the *O. hauseri* subgroup. From all the Himalayan species of this group, it is reliably distinguished by the morphology of the paramere, from most species additionally also by the chaetotaxy of the pronotum (absence of black setae at the lateral margins) and by the shape of the ventral process of the aedeagus. For illustrations of the external and sexual characters of the Himalayan representatives of the *O. hauseri* group see Assing (2006c).

### Distribution and bionomics

The type locality is situated in eastern Nepal, where the holotype was collected at an altitude of 1800 m. Additional bionomic data are not available.

## *Orphnebius scissus* **n. sp.**
(Figs. 47–55)

### Type material

Holotype ♂: "China (Yunnan), Baoshan Pref., Gaoligong Shan nr. Xiaoheisha N. R., 29 km ESE Tengchong, 24°55'37"N, 98°45'09"E, 2350 m (devast. decid. forest with clearings and shrubs, litter, wood, sifted), 1.VI.2007, D. W. Wrase [15] / Holotypus ♂ *Orphnebius scissus* sp. n. det. V. Assing 2007" (cAss).

### Etymology

The name (Latin, adjective: incised) refers to the distinctive lateral incision of the paramerite.

### Description

Body length: 4.4 mm. Habitus as in Fig. 47. Coloration: forebody black; abdomen bright pale reddish; legs with the femora blackish-brown, tibiae and tarsi dark reddish-brown; antennae blackish-brown, with antennomeres I–IV reddish.

Head distinctly transverse, approximately 1.25 times as wide as long, posteriorly vertically sloping ventrad towards neck, but not angulate; posterior margin of head between posterior margins of eyes in dorsal view smoothly and moderately convex, i. e., posterior angles completely obsolete; neck little more than 0.3 times as wide as head; punctation extremely fine and sparse, punctures present only in lateral and posterior areas, median dorsal area impunctate; microsculpture absent. Eyes very large and bulging, somewhat longer than postocular region in dorsal view (Fig. 48). Antenna moderately asymmetric; antennomeres IV weakly transverse, V–VI moderately transverse, and VII–X strongly transverse; X approximately twice as wide as long; XI almost as long as combined length of VIII–X (Fig. 49).

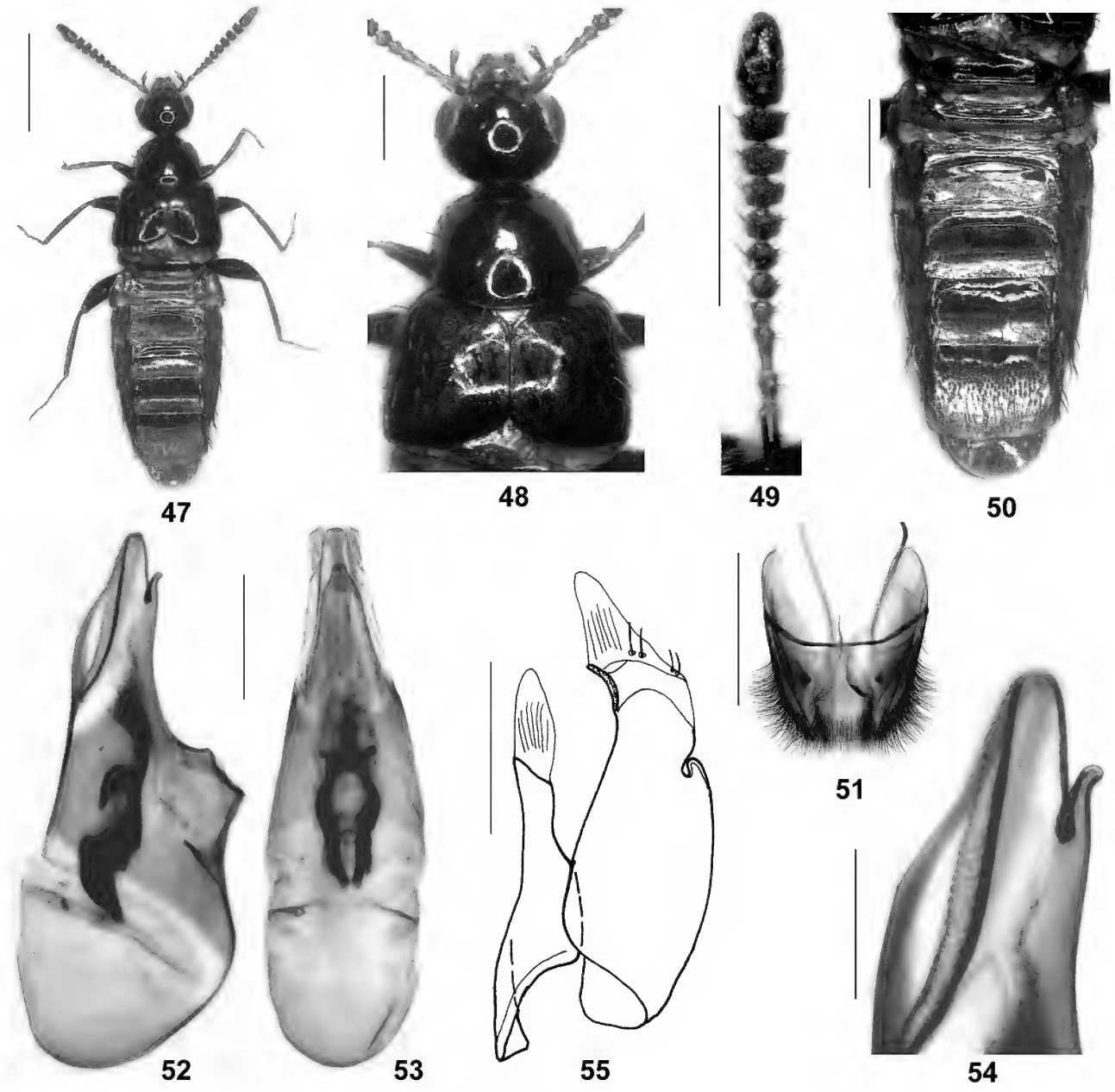
Pronotum (Fig. 48) strongly convex in cross-section, distinctly transverse, almost 1.25 times as wide as long and 1.20 times as wide as head; maximal width in posterior half, posterior angles obsolete; disc impunctate, punctation present only at margins; lateral margins each with four dark setae of slightly more than ¼ the length of pronotum.

Elytra 1.60 times as wide and at suture approximately 0.7 times as long as pronotum, distinctly widened posteriad (Fig. 48); punctation very sparse and fine; microsculpture absent; pubescence suberect, long, and brownish. Hind wings fully developed. Legs of moderate length; metatarsomere I shorter than combined length of II–III.

Abdomen (Fig. 50) widest at segment III, distinctly and gradually tapering posteriad; integument without microsculpture; paratergites sharply edged and strongly elevated, gradually decreasing in height and width from segments III–VI; tergites III–VI impunctate except for four setiferous punctures at posterior margins of tergites IV–VI; disc of tergite VII, too, impunctate, posterior margin with more numerous short setae; whole surface of tergite VII with short striae somewhat resembling oblong punctures; posterior margin of tergite VII with distinct palisade fringe; tergite VIII impunctate, except for two rows of submarginal and marginal punctures bearing black setae.

♂: segments IX–X modified, with dense and long black pubescence (Fig. 51); median lobe of aedeagus 0.82 mm long and slender, with slender, apically acute, and weakly bent ventral process Figs. 52–54); paramere with condylite distinctly shorter than paramerite, paramerite apically with four short setae and laterally with incision of distinctive shape (Fig. 55).

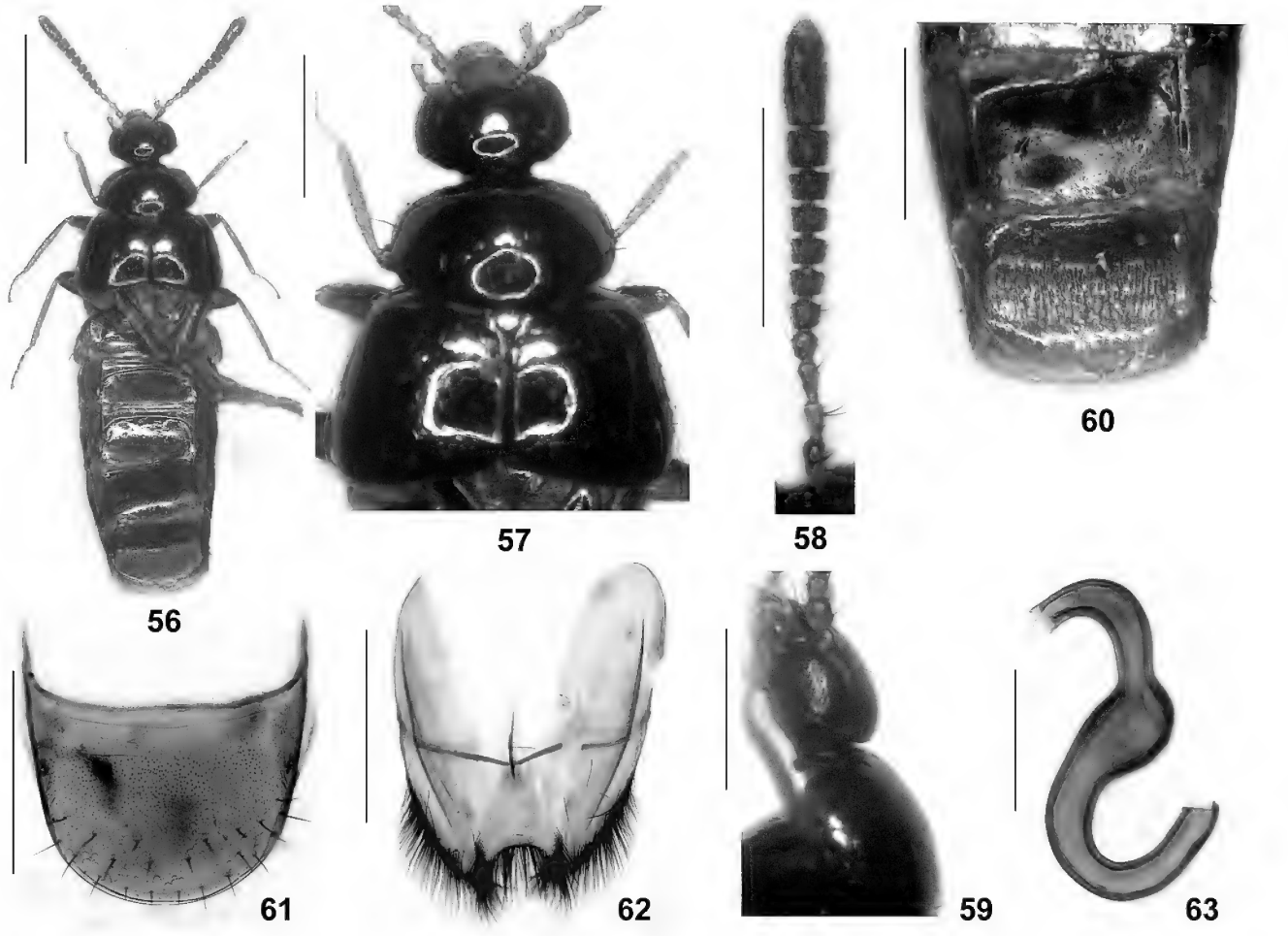
♀: unknown.




**Figs. 47–55.** *Orphnebius scissus* n. sp., holotype. – **47**. Habitus. **48**. Forebody. **49**. Antenna. **50**. Abdomen. **51**. Male abdominal segments IX–X. **52**, **53**. Median lobe of aedeagus in lateral and in ventral view. **54**. Apex of median lobe of aedeagus in lateral view. **55**. Paramere. – Scale bars: 1.0 mm (47), 0.5 mm (48–51), 0.2 mm (52, 53, 55), 0.1 mm (54).

## Comparative notes

Based on external features (chaetotaxy of pronotum, asymmetric antennae, morphology and chaetotaxy of abdomen, distinctly bicoloured body) and sexual characters (modifications of male segments IX–X, morphology of median lobe of aedeagus, shape of paramere), the species doubtlessly belongs to the *O. hauseri* group. Five species of this group were previously known from China (Assing 2006d). From all of them, *O. scissus* is readily distinguished by the distinctive morphology of the median lobe of the aedeagus and the paramere, as well as by the characteristic sculpture of the abdominal tergite VII. From *O. longistriatus*, whose male sexual characters are unknown, it is additionally separated by distinctly smaller size, a larger impunctate area on the head, distinctly paler antennomeres I–IV (in *O. longistriatus* dark brown to blackish-brown), the distinctly longer elytral pubescence, and the much brighter coloration of the abdomen (segments III–VI




**Figs. 56–63.** *Orphnebius truncus* n. sp., holotype. – **56**. Habitus. **57**. Forebody. **58**. Antenna. **59**. Head and pronotum in lateral view. **60**. Abdominal segments VI–VII in dorsal view. **61**. Tergite VIII. **62**. Female abdominal segments IX–X. **63**. Spermatheca. – Scale bars: 1.0 mm (56), 0.5 mm (57–62), 0.1 mm (63).

in *O. longistriatus* blackish to brown). For illustrations of the external and sexual characters of other *Orphnebius* species known from China and the Himalaya see Assing (2006c, 2006d).

### Distribution and bionomics

The type locality is situated near Tengchong (China: W-Yunnan). The holotype was sifted from the leaf litter of a deciduous forest at an altitude of 2350 m.

## *Orphnebius truncus* **n. sp.**
(Figs. 56–63)

### Type material

Holotype ♀: "China: Yunnan [CH07-16], Baoshan Pref., mountain range 14 km E Tengchong, 1850 m, 25°00'28"N, 98°38'07"E, second. mixed forest, litter sifted, 1.VI.2007, M. Schülke / Holotypus ♀ *Orphnebius truncus* sp. n. det. V. Assing 2007" (cAss).

### Etymology

The name (Latin, adjective: truncated) refers to the shape of the head.

### Description

Body length: 4.1 mm. Habitus as in Fig. 56. Coloration: forebody black; abdomen bright pale reddish; legs reddish-brown, femora only indistinctly darker; antennae dark brown, with antennomeres I–IV and apex of XI reddish.

Head strongly transverse, approximately 1.30 times as wide as long; posterior margin distinctly angled, i. e., dorsal and posterior face of head meeting approximately at right angles (visible both in lateral and in dorsal view, posterior face vertically sloping ventrad towards neck;

eyes large, almost reaching posterior margin; neck less than 0.4 times as wide as head (Figs. 57, 59); punctation extremely fine and sparse, punctures present only in lateral and posterior areas, median dorsal area impunctate; microsculpture absent; pubescence sparse, long, and whitish. Antennae not distinctly asymmetric; antennomeres IV weakly transverse; V–IX of similar length, increasingly transverse and of gradually increasing width; IX less than twice as wide as long; X somewhat longer and less transverse than IX; XI conspicuously long, as long as combined length of VIII–X (Fig. 58).

Pronotum (Fig. 57) strongly transverse, 1.55 times as wide as long and 1.42 times as wide as head; lateral and posterior margins smoothly rounded, i. e., posterior angles obsolete; lateral margins each with four long blackish setae (one in anterior angle, two lateral, one in transitional region between lateral and posterior margins) of ¼–⅓ the length of pronotum; pronotum otherwise impunctate, except for few punctures at posterior margin.

Elytra 1.70 times as wide and at suture approximately as long as pronotum, distinctly widened posteriad (Fig. 57); punctation very sparse and fine; microsculpture absent; pubescence depressed to suberect, long, and whitish. Hind wings fully developed. Legs relatively short; metatarsus less than 0.7 times the length of metatibia; metatarsomere I slightly longer than II, but distinctly shorter than combined length of II–III.

Abdomen widest at base, distinctly and gradually tapering posteriad; integument without microsculpture; paratergites sharply edged and strongly elevated, gradually decreasing in height and width from segments III–VIII; tergites III–VI impunctate except for two setiferous punctures at posterior margins of tergites IV–VI; disc of tergite VII, too, impunctate, posterior margin with approximately ten setae; median ⅓ of tergite VII with short striae somewhat resembling oblong punctures (Fig. 60); posterior margin of tergite VII with distinct palisade fringe; tergite VIII impunctate, except for two rows of submarginal and marginal punctures bearing black setae (Fig. 61).

♂: unknown.

♀: segments IX–X distinctly modified, with dense and long black pubescence (Fig. 62); spermatheca of distinctive shape (Fig. 63).

### Comment

The shapes of the proximal and distal ends of the spermatheca raise the suspicion that they may be damaged and that parts may be missing. However, despite a careful search of the whole abdomen of the holotype, I have been unable to find any additional parts. In any case, even if the spermatheca illustrated in Fig. 63 is incomplete, the remainder is highly distinctive and not to be confused with any of the spermathecae known from other Palaearctic species.

### Comparative notes

The only species known from China with a similarly shaped head and pronotum is *Orphnebius conicornis* Assing, which is known only from the type locality in the Daba Shan at the border between Sichuan and Shaanxi. From this species, *O. truncus* is immediately separated by the darker coloration of the pronotum (in *O. conicornis* brown), the elytra (in *O. conicornis* yellowish with the area near the posterior angles extensively blackish), and the legs (in *O. conicornis* uniformly pale reddish), by the longer and more slender antennomere XI, the distinctly fewer and longer setae at the lateral and posterior margins of the pronotum, as well as by the longer and denser striation of the abdominal tergite VII. For illustrations of the external and sexual characters of *O. conicornis* see Assing (2006d).

### Distribution and bionomics

The type locality is situated near Tengchong (China: W-Yunnan). The holotype was sifted from the leaf litter of a secondary mixed forest at an altitude of 1850 m.

## *Orphnebius tricuspis* **n. sp.**

(Figs. 64–68)

### Type material

Holotype ♀: "China (Yunnan), Baoshan Pref., Gaoligong Shan nr. Xiaoheisha N. R., 35 km SE Tengchong, 2110 m, 24°50'16"N, 98°45'43"E, (prim. decid. forest, litter, sifted), 30.V./4.VI.2007, D. W. Wrase [11] / Holotypus ♀ *Orphnebius tricuspis* sp. n. det. V. Assing 2007" (cAss).

### Etymology

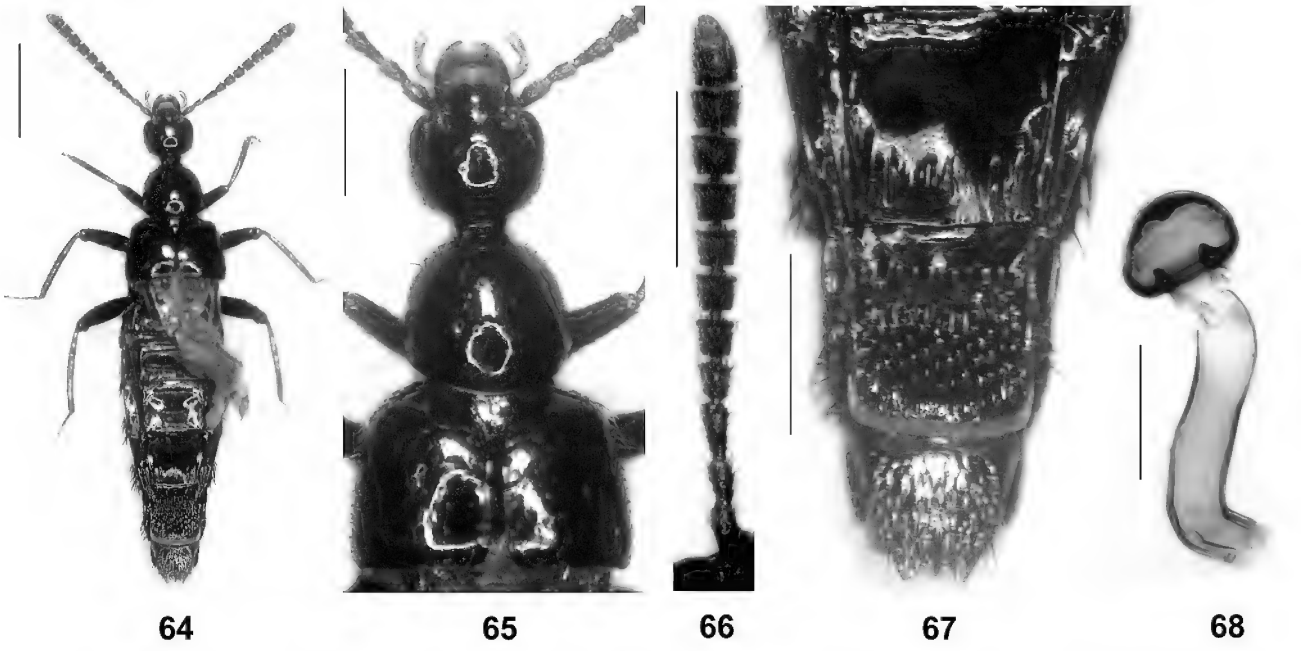
The name (Latin, adjective) refers to the three processes at the posterior margin of the abdominal tergite VIII.

### Description

Body length: 5.3 mm. Habitus as in Fig. 64. Coloration: forebody black; abdominal segments III–VI reddish, segment VII dark brown, segment VIII reddish-brown; legs bicoloured, with the femora blackish, tibiae and tarsi reddish-brown; antennae dark brown, with antennomeres I–II and apex of XI paler; mouthparts reddish.

Head approximately as long as wide; neck approximately 0.4 times as wide as maximal head width; integument with sparse and very fine punctation, without microsculpture, and distinctly glossy. Eyes large and almost as long as postocular region (Fig. 65). Antennae not distinctly asymmetric, relatively massive, apically gradually incrassate (Fig. 66).

Pronotum (Fig. 65) very weakly transverse, approximately 1.03 times as wide as long and 1.25 times as wide as head; maximal width in posterior half, strongly convex




**Figs. 64–68.** *Orphnebius tricuspis* n. sp., holotype. – **64**. Habitus. **65**. Forebody. **66**. Antenna. **67**. Abdominal segments V–VII in dorsal view. **68**. Spermatheca. – Scale bars: 1.0 mm (64), 0.5 mm (65–67), 0.1 mm (68).

in cross-section; punctation fine and very sparse; surface without microsculpture and with distinct luster.

Elytra 1.55 times as wide and at suture 0.80 times as long as pronotum (Fig. 65); punctation very sparse and fine, but less so than that of head and pronotum; microsculpture absent; pubescence suberect, long, and brownish. Hind wings fully developed. Legs of moderate length; metatibia curved; metatarsus 0.8 times as long as metatibia; metatarsomere I approximately as long as combined length of II–III.

Abdomen widest at segment IV, segments V–VIII distinctly and gradually tapering posteriad; integument without microsculpture; paratergites of segments IV–VI broad, those of segment VI distinctly less elevated than those of segment IV; tergites III–VI with four setiferous punctures at posterior margin and one lateral setiferous puncture on either side, otherwise impunctate; tergite VI in posterior half laterally with distinct keel, between these keels with three shorter and distinctly finer keels and with some indistinct striae; tergite VII with pronounced longitudinal ridges separating series of shorter ridges (at lower magnification appearing like coarse punctation), central area without pubescence, posterior margin with pronounced palisade fringe; tergite VIII distinctly punctate and with pubescence, posterior margin with three tooth-like processes (Fig. 67).

♂: unknown.

♀: sternite VIII distinctly convex posteriorly; segments IX–X without pronounced modifications; spermatheca as in Fig. 68.

Comparative notes

Among all its Palaearctic congeners, *O. tricuspis* is similar only to *O. nanlingensis* Pace, evidently its closest known relative, as can be inferred from the synapomorphic derived morphology of the abdominal tergites VI–VIII. All other Palaearctic species lack the longitudinal keels on tergite VI, have a differently sculptured tergite VII, and a tergite VIII without posterior processes. The new species is distinguished from *O. nanlingensis*, whose female sexual characters are unknown, by numerous external characters alone, especially the larger body size, the distinctive coloration (*O. nanlingensis*: head, pronotum, and abdomen more or less uniformly dark brownish; elytra yellowish-brown; legs reddish-brown, not distinctly bicoloured; antennae reddish-brown with antennomeres I–III pale reddish), the completely different head shape (in *O. nanlingensis* distinctly transversely rectangular and with more pronounced posterior angles); the distinctly longer antennae (in *O. nanlingensis* antennomeres VI–X distinctly transverse), the sparser and shorter pubescence of the pronotum, and by the longer legs with much longer tarsi. For illustrations of the external and sexual characters of *O. nanlingensis* see Assing (2006d).

Distribution and bionomics

The type locality is situated near Tengchong (China: W-Yunnan). The holotype was sifted from the leaf litter of a deciduous forest at an altitude of 2110 m.

### 3.8 Genus *Lomechusa* Gravenhorst, 1806

According to a recent revision (HLAVÁČ 2005a), *Lomechusa* has a Palaearctic distribution and currently includes 13 species. Five species are distributed in the Western Palaearctic and eight in the Eastern Palaearctic (including Middle Asia). One species, *L. malaisei* (Scheerpeltz, 1965) was originally described from Myanmar, which is usually attributed to the Oriental region, but the type locality is a pass directly at the border between Myanmar and Yunnan province, China. As far as is currently known, all the species are strictly myrmecophilous. Most, if not all of the species are associated with ants of the genus *Formica* Linnaeus in summer and with *Myrmica* Latreille species in the winter. Some species, however, have also – perhaps accidentally – been found with ants of the genus *Lasius* Fabricius.

The primary genitalia are remarkably uniform and consequently of little use for taxonomic and identification purposes. The species are reliably separated only based on external characters (HLAVÁČ 2005a).

#### *Lomechusa gerardiphila* **n. sp.**
(Figs. 69–78)

##### Type material

H o l o t y p e ♂ [with worker of *Formica gerardi* attached to the same pin]: "E – Andalucía [15], Sierra de los Filabres, S Serón, 1800 m, grassland, 37°15'44N, 02°30'30W, 19.III.2008, V. ASSING / Holotypus ♂ *Lomechusa gerardiphila* sp. n. det. V. ASSING 2008" (cAss).

P a r a t y p e s : 2 ♂♂, 1 ♀: same data as holotype (cAss).

##### Etymology

The name (adjective) refers to the fact that the species is associated with the ant *Formica gerardi*.

##### Description

Body length: 4.8–5.5 mm. Habitus as in Fig. 69. Coloration: head dark brown to blackish-brown; pronotum dark reddish; elytra pale reddish; abdomen reddish, with segments V–VI and sometimes also anterior part of VII blackish; legs and antennae dark reddish.

Head 1.05–1.10 times as long as wide; width approximately 0.7 mm; median dorsal area shallowly, but distinctly impressed; integument with pronounced microreticulation and completely matt; punctation fine, indistinct, barely noticeable at magnification of 50×; pubescence extremely short, depressed, and sparse. Eyes moderately bulging, slightly shorter than postocular region in dorsal view (Fig. 70). Antennae moderately long and not conspicuously massive; antennomere I large and oval in cross-section; antennomere II much shorter than I, almost twice as long as wide; III approximately 1.4 times as long as II; IV–V approximately as wide as long (IV sometimes weakly transverse and X sometimes weakly oblong); XI elongated, longer than combined length of IX–X, but distinctly shorter than combined length of VIII–X (Figs. 71, 72).

Pronotum approximately 1.20–1.25 mm wide, 0.85–0.90 mm long, 1.45 times as wide as long, and 1.8 times as wide as head; postero-lateral angles marked, but not distinctly projecting latero-caudad, lateral and posterior margins meeting approximately at angle of 90° in dorsal view; lateral margins weakly concave in dorsal view; posterior margin distinctly projecting caudad in the middle; disc anteriorly on either side of midline with pronounced subcircular impression; microsculpture similar to that of head; pubescence not discernible (Fig. 70).

Elytra approximately 1.2 times as wide and at suture 0.9 times as long as pronotum (Fig. 70); whole surface with pronounced, but not distinctly isodiametric microsculpture, slightly less matt than head and pronotum, with dense, fine, and indistinct punctation and with extremely short and depressed pubescence. Hind wings apparently fully developed. Legs slender; metatarsomere I longer than II and slightly shorter than the combined length of II–III.

Abdomen approximately as wide as elytra, widest at segment V; tergites II–IV each with 1–2 macrosetae in postero-lateral angles; microsculpture very shallow, almost indistinct; tergites II–VI with dense fine punctation and with dense short pubescence; tergites VII–VIII with much sparser and even finer punctation, without appreciable pubescence; posterior margin of tergite VII with very fine, possibly incomplete palisade fringe (Fig. 73); tergite VIII broadly excavate, this excavation of almost trapezoid shape, posterior margin in the middle very weakly concave, almost truncate (Fig. 74).

♂: sternite VIII strongly convex posteriorly; median lobe of aedeagus as in Figs. 76, 77.

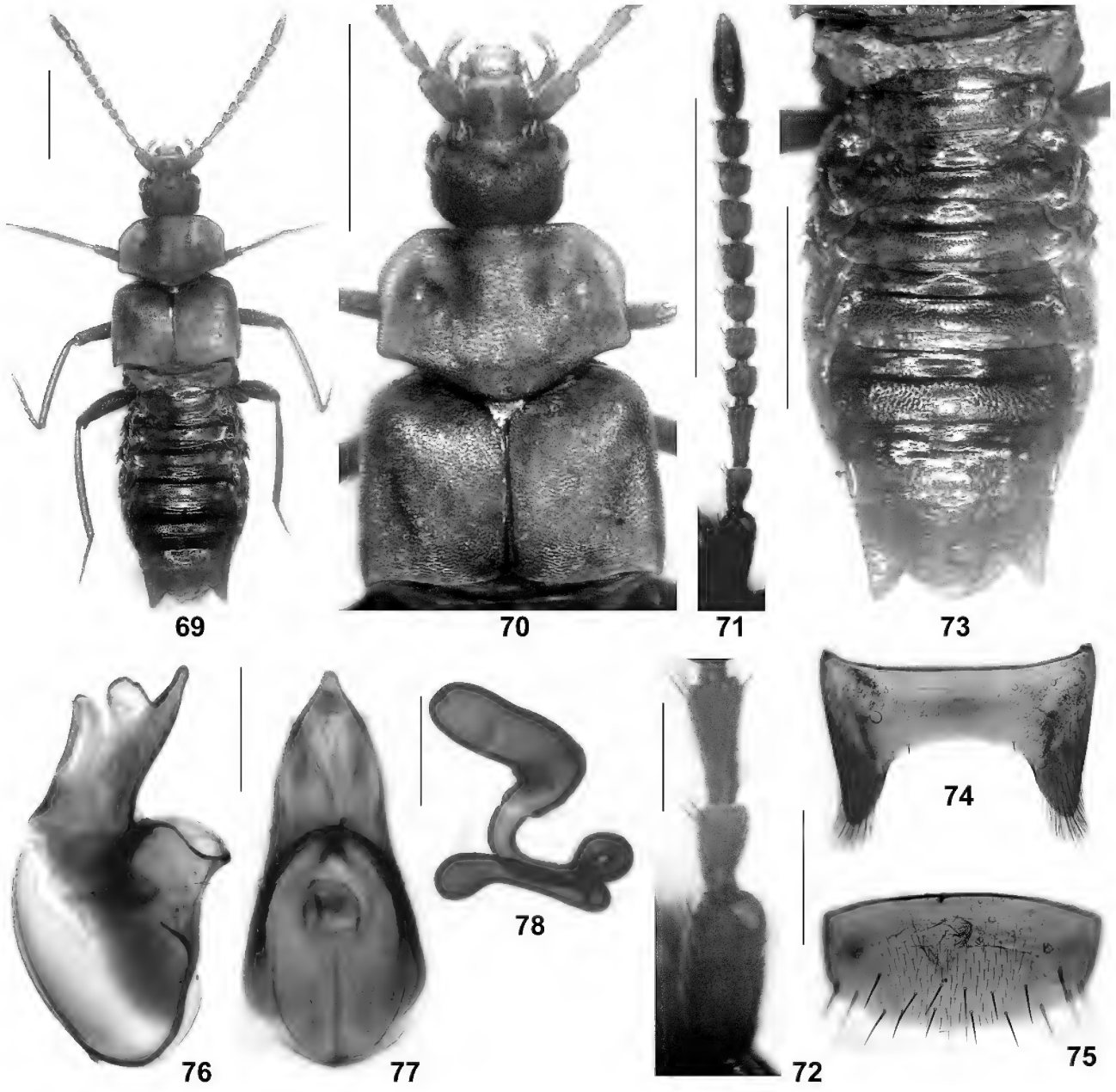
♀: sternite VIII broadly and very weakly convex posteriorly (Fig. 75); spermatheca as in Fig. 78.

##### Comparative notes

Based on the shape of the pronotum, the elytra, and the antennae, HLAVÁČ (2005a) distinguishes three species groups. According to this typological concept, the new species belongs to the *paradoxa* group. From the geographically close representatives of this group, *L. gerardiphila* is distinguished as follows:

from *L. bifoveolata* Brisout de Barneville, 1860 (Spain, France) by the less flattened antennomere I, the more slender antennomere II, the presence of macrosetae on the abdominal tergites II–IV, the much sparser and finer punctation of tergite VII, the slightly less broad posterior excavation of tergite VIII, and the posteriorly less convex female sternite VIII;

from *L. paradoxa* Gravenhorst, 1806 (Europe) by the distinctly less massive antennae (with more slender anten-




**Figs. 69–78.** *Lomechusa gerardiphila* n. sp. (70, 71, 73, 76, 77: holotype). – **69**. Habitus. **70**. Forebody. **71**. Antenna. **72**. Antennomeres I–III. **73**. Male abdomen. **74**. Female tergite VIII. **75**. Female sternite VIII. **76**, **77**. Median lobe of aedeagus in lateral and in ventral view. **78**. Spermatheca. – Scale bars: 1.0 mm (69–71, 73), 0.5 mm (74–75), 0.1 mm (72, 76–78).

nomeres I and II and much less transverse antennomeres IV–X), by the different morphology of the pronotum (more marked antero-lateral projections, much deeper anterior impressions, more strongly projecting posterior margin), by the presence of only 1–2 macrosetae in the posterior angles of tergites II–IV (in *L. paradoxa* usually 3–4), by the much finer and sparser punctation of tergite VII, and by the almost trapezoid posterior excavation of tergite VIII;

from *L. atlantica* (Koch, 1937) (Morocco) by distinctly shorter and less massive antennae, different morphology of the pronotum (less pronounced and less acute posterior angles), sparser and finer punctation of tergite VII, and by the almost trapezoid posterior excavation of tergite VIII;

from *L. pubicollis* Brisout de Barneville, 1860 (Europe) by much smaller and more slender body, distinctly less massive antennae, completely different shape of the pronotum, much fewer macrosetae on the anterior ab-

dominal tergites, the distinctly denser punctation and pubescence of tergites II–VI, and by the less broadly excavated tergite VIII;

from *L. bordonii* Hlaváč, 2005 (Sicily) by smaller size, different coloration (*L. bordonii*: pronotum dark, abdomen uniformly dark brown to black), and much shorter antennae.

For a key to the species of *Lomechusa*, including colour habitus photographs, see Hlaváč (2005a).

Distribution and bionomics

The type locality is situated in the Sierra de los Filabres, a mountain range to the northeast of the Sierra Nevada in Andalucía, southern Spain. It is a patch of occasionally grazed grassland with shrubs and trees in a valley at an altitude of 1800 m; for a photograph see Assing (2008c: fig. 19). The type specimens were collected from a small nest (effect of presence of *Lomechusa*?) of *Formica (Serviformica) gerardi* Bondroit, 1917 (det. B. Seifert) under a stone.

## 3.9 Genus *Zyras* Stephens, 1835

According to Smetana (2004) and an updated version of the catalogue (Schülke unpubl.), the genus is represented in the Palaearctic region by more than 80 species and eight subgenera; seven species are listed as incertae sedis. The vast majority of species have not been revised and the systematic status of at least some of the subgenera is doubtful.

### *Zyras (Termidonia) nepalensis* Pace, 1992

Additional material examined (total: 4 exs.)

**Nepal**: 19 exs., Manaslu, Meme Pokhari Lekh, Taksar village, 1700 m, 30.VIII.1995, leg. Schmidt (DEI, cAss).

Comment

The known distribution of this conspicuous species is confined to Nepal (Smetana 2004). The original description is based on a single specimen collected near Pokhara in cattle dung (Pace 1992b).

### *Zyras (Termidonia) viti* **n. sp.**
(Figs. 79–90)

Type material

Holotype ♂ [with worker of unidentified termite attached to the pin]: "Taiwan – Taitung Co., road no. 20, km 184, 600 m, 10.IV.2007, S. Vit / Holotypus ♂ *Zyras viti* sp. n. det. V. Assing 2008" (cAss).

Paratypes: 5♂♂, 14♀♀ [2♀♀ slightly teneral]: same data as holotype (MHNG, cAss).

Etymology

The species is dedicated to the coleopterist Stanislav Vit, Genève, who collected the type series.

Description

Body length: 9.0–11.5 mm. Coloration: head blackish; pronotum dark reddish; elytra dark brown; abdomen blackish, with the posterior margins of the segments reddish-brown; legs and antennae reddish to reddish-brown.

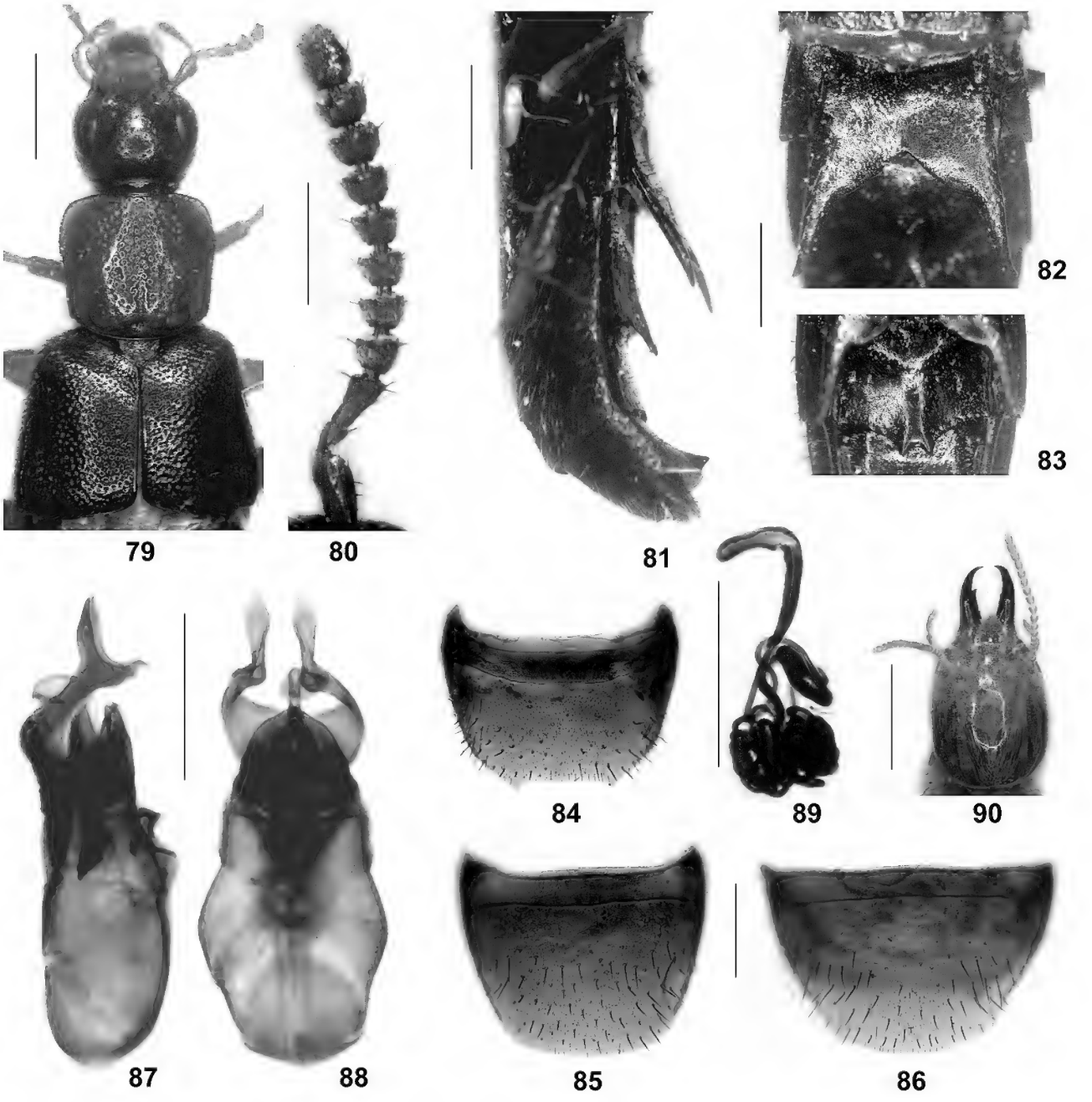
Head (Fig. 79) approximately as long as wide or weakly oblong (length measured from anterior margin of anteclypeus); punctation sparse in median dorsal area, moderately sparse in lateral and posterior dorsal areas (interstices on average approximately as wide as punctures), and rather shallow; microsculpture subject to sexual dimorphism; eyes large and bulging, more than twice as long as postocular region in dorsal view; anteclypeus strongly developed, almost as long as labrum; maxillary palpus elongate, palpomere III approximately 6 times as long as wide. Antennae not distinctly flattened and short, barely reaching posterior margin of pronotum when directed caudad; antennomere III distinctly dilated apically, nearly twice as long as wide; IV–X slightly asymmetric, of similar width, approximately 1.5 times as wide as long or nearly so (Fig. 80).

Pronotum (Fig. 79) slender, approximately 1.2 times as wide as head and 1.05–1.10 times as wide as long, laterally, anteriorly, and posteriorly finely margined; maximal width near anterior angles; posterior angles marked; posterior ½–⅔ of midline narrowly impressed; margins with numerous long, erect, brownish setae; disc with sparse, short, fine, suberect, whitish pubescence; punctation distinctly denser and coarser than that of head.

Elytra dilated posteriad, at posterior margin approximately 1.5 times as wide, and at suture almost as long as pronotum (Fig. 79); punctation conspicuously dense and defined, but finer than that of pronotum. Hind wings fully developed. Mesofemur and -tibia, and especially metafemur and -tibia somewhat flattened.

Abdomen approximately as wide as elytra at posterior margin, widest at segment V; microsculpture present, but mostly shallow; punctation fine and moderately dense; tergites IV, V, and VII with pronounced sexual dimorphism.

♂: head dorsally with pronounced, finely isodiametric microsculpture and matt; tergite IV conspicuously modified, posterior margin elongated, suberect, and on either side with long and acute process (Figs. 81, 82); posterior margin of tergite V in the middle produced and with bifurcate suberect process (Figs. 81, 83); tergite VII at posterior margin with pronounced tubercle (Fig. 81); posterior margin of tergite VIII in the middle truncate and on either side




**Figs. 79–90.** *Zyras viti* n. sp. (81–83: holotype). – **79**. Female forebody. **80**. Antenna. **81**. Male abdomen in lateral view. **82**. Male tergite IV in dorsal view. **83**. Male tergite V in dorsal view. **84**. Male tergite VIII. **85**. Male sternite VIII. **86**. Female sternite VIII. **87**, **88**. Median lobe of aedeagus in lateral and in ventral view. **89**. Spermatheca. **90**. Head of host termite. – Scale bars: 1.0 mm (79, 81–83, 90), 0.5 mm (80, 84–89).

dentate (Fig. 84); sternite VIII with weakly convex posterior margin (Fig. 85); aedeagus with conspicuous processes (Figs. 87, 88).

♀: head with very shallow microsculpture and somewhat shiny (Fig. 79); tergites IV, V, and VII unmodified; tergite VIII similar to that of male; sternite VIII with moderately convex posterior margin (Fig. 86); spermatheca as in Fig. 89.

### Intraspecific variation

The process of the male tergite V is subject to some intraspecific variation. In one of the male type specimens it is almost completely reduced.

### Comparative notes

*Zyras viti* shares various evident synapomorphies (sexual dimorphism of the microsculpture of the head, modifi-

cations of the male abdomen, median lobe of the aedeagus with conspicuous apico-lateral processes) with species of the subgenus *Termidonia* Motschulsky, 1860. According to SMETANA (2004), this subgenus is represented in the Palaearctic region by nine species, only one of which, *Z. abbreviatus* Fenyes, 1914, has been reported from Taiwan (FENYES 1914); another species, *Z. longwangmontis* Pace, 1998, has been recorded from Zhejiang and Hongkong. According to the original description of *Z. abbreviatus*, which is based on a single female, the species is readily distinguished from *Z. viti* by smaller size (body length 5.5 mm), much more transverse pronotum (approximately 1.5 times as wide as long), and numerous other characters. From *Z. longwangmontis*, the new species is separated by shorter antennae, darker abdomen (in *Z. longwangmontis* reddish-brown with reddish base), different modifications of the male abdomen, and different shape of the aedeagus. For illustrations of the male habitus and the aedeagus of *Z. longwangmontis* see PACE (1998b). From *Z. nepalensis*, which is of similar size and coloration, *Z. viti* differs by not distinctly flattened antennae, much coarser and sparser punctation of the pronotum, a more slender pronotum, completely different and more conspicuous modifications of the male abdomen, and by the different shape of the median lobe of the aedeagus; for illustrations of *Z. nepalensis* see PACE (1992b).

Four of the species listed as incertae sedis by SMETANA (2004) are from Taiwan. All of them were described by BERNHAUER (1914) based on material from Taiwan (*Z. formosae*, *Z. roepkei*, *Z. sauteri*) and Myanmar (*Z. bidentatus*). The details indicated in the original descriptions suggest that these four species refer to *Termidonia*, too; all of them are particularly distinguished from *Z. viti* by the modifications of the male abdomen.

## Distribution and bionomics

The species is known only from the type locality, which is situated in Taitung County, Taiwan. The specimens were collected from a decaying tree trunk inhabited by termites of an unidentified species (Fig. 90). Two of the female paratypes are slightly teneral.

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# A revision of *Leptobium* Casey. IV. Three new species and additional records (Coleoptera: Staphylinidae: Paederinae)

Volker Assing

Abstract

Three species of *Leptobium* Casey, 1905 are described and illustrated: *L. castroi* **n. sp.** (Spain: Andalucía: Jaén), *L. anlasi* **n. sp.** (Turkey: Manisa), and *L. vitalyi* **n. sp.** (southern Kazakhstan). The Palaearctic genus now includes 62 species and three subspecies. Additional records of 22 species and subspecies are reported. The distributions of seven species are mapped.

K e y w o r d s : Staphylinidae, Paederinae, *Leptobium*, Palaearctic region, taxonomy, new species, distribution, new records.

Zusammenfassung

Drei Arten der Gattung *Leptobium* Casey, 1905 werden beschrieben und abgebildet: *L. castroi* **n. sp.** (Spanien: Andalusien: Jaén), *L. anlasi* **n. sp.** (Türkei: Manisa) und *L. vitalyi* **n. sp.** (südliches Kasachstan). Die paläarktisch verbreitete Gattung umfasst damit derzeit 62 Arten und drei Unterarten. Weitere Nachweise von 22 Arten und Unterarten werden gemeldet. Für sieben Arten werden Verbreitungskarten erstellt.

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## 1 Introduction

According to a recent revision of *Leptobium* Casey, 1905, the genus has a Palaearctic distribution and includes a total of 59 valid species, with one species from Morocco and the Canary Islands represented by four subspecies (Assing 1999, 2005, 2006). The vast majority of species are distributed in the Mediterranean region. With few exceptions, *Leptobium* species are brachypterous; consequently their dispersal power is low and their distributions are usually more or less restricted. Some species have been recorded only from their respective type localities. In many cases the limits of the distributions are unclear, primarily because of a lack of data, which, at least partly, explains the patchy distribution patterns of some of the more widespread representatives of the genus. However, the available evidence for some better-studied species, e. g., *L. illyricum* (Erichson, 1840), suggests that such disjunct ranges may in fact be interpreted as relict distributions resulting from a history of local extinctions on the one hand and favoured by low dispersal power, and a consequently low potential for recolonisation, on the other (Assing 2005). In any case, more data are needed to better understand the zoogeography of the genus.

Since the latest instalment to the revision, additional material has become available from various museum collections and private collectors. This material not only yielded numerous additional records of zoogeographic interest, but also three undescribed species from the Mediterranean region and Middle Asia, so that the genus now comprises 62 species and three subspecies.

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## 2 Material, methods, and depositories

A total of 267 specimens of *Leptobium* deposited in the following public institutions and private collections were examined:

| | |
|---|---|
| BMNH | The Natural History Museum, London, U.K. (R. Booth) |
| cAnl | private collection S. Anlaş, Turgutlu, Turkey |
| cApf | private collection W. Apfel, Eisenach, Germany |

cAss author's private collection
cFel private collection B. Feldmann, Münster, Germany
cKas private collection V. Kastcheev, Almaty, Kazakhstan
cOro private collection P. Oromí, La Laguna, Spain
cSch private collection M. Schülke, Berlin, Germany
cSta private collection W. Starke, Warendorf, Germany
cVai private collection D. Vailati, Brescia, Italy
cVav private collection J. Vávra, Ostrava-Krásné Pole, Czech Republic
HNHM Hungarian Natural History Museum, Budapest, Hungary (Gy. Makranczy, O. Merkl)
MNCN Museo Nacional de Ciencias Naturales, Madrid, Spain (I. Izquierdo)
NHMW Naturhistorisches Museum, Wien, Austria (H. Schillhammer)
SMF Senckenberg-Museum, Frankfurt/Main, Germany (A. Hastenpflug-Vesmanis)
SMNS Staatliches Museum für Naturkunde, Stuttgart, Germany (W. Schawaller, K. Wolf-Schwenninger)

The morphological studies were conducted using a Stemi SV 11 microscope (Zeiss Germany) and a Jenalab compound microscope (Carl Zeiss Jena). For the photographs a digital camera (Nikon Coolpix 995) was used. The maps were generated using the online generic mapping tool (GMT) of the Geomar website at www.aquarius.ifm-geomar.de/omc.

In the species descriptions, the measurements are abbreviated as follows:

EL length of elytra at suture, from apex of scutellum to posterior margin
HL head length from anterior margin of frons to neck
HW maximal head width
ML length of aedeagus from base to apex of dorsal plate
PL length of pronotum along midline
PW maximal width of pronotum
TaL length of metatarsus
TiL length of metatibia
TL body length from mandibles to posterior margin of abdominal tergite VIII

Labels of type material are cited in their original spelling and language, except for the following adaptations according to the general format requirements of the journal: names of persons (except authors of species) in small capitals, scientific names of genera and species in italics, dates with the months always in Roman numbers.

In the results section, the species are ordered according to species groups.

## 3 Results

### 3.1 Additional records

#### *Leptobium gracile* (Gravenhorst, 1802)

Additional material examined (total: 39 exs.)

**Spain**: **Andalucía**: 10 exs., Sierra de Segura, ca. 10 km SW Santiago de la Espada, 38°03'N, 2°38'W, 1430 m, pasture and field margin, under stones, 16.III.2008, leg. Andújar & Assing (cAss).

**Austria**: **Niederösterreich**: 2 exs., Mödling (NHMW). – **Burgenland**: 2 exs., Neusiedlersee (NHMW).

**Italy**: **Sardinia**: 1 ex., locality not specified (HNHM).

**Bosnia-Herzegovina**: 1 ex., Mostar, leg. Czerny (NHMW).

**Bulgaria**: 4 exs., Chirpan ["Tschirpan"], 4.–31.III.1941, leg. Schubert (NHMW).

**Greece**: 1 ex., Pelopónnisos, S Tripoli, Kandalos, 37°26'N, 22°22'E, 670 m, 5. and 9.V.2007, leg. Schnitter (cApf); 1 ex., "Attica" (NHMW); 1 ex., "Graecia" (NHMW); 1 ex., Crete, locality not specified, V.1965, leg. Kritscher (NHMW).

**Turkey**: **Ankara**: 1 ex., SE Ankara, N-Elma Dağı, 1300 m, hollow *Salix* trunk, 31.X.1995, leg. Vit (cAss). – **Niğde:** 1 ex., Çamardi env., Orhaniye, Ala Dağlar, 1800–2200 m, 19.V.2005, leg. Vávra (cVav). – **Gaziantep**: 1 ex., 11 km W Araban, 2.VII.2006, leg. Anlaş (cAnl). – **Diyarbakır**: 1 ex., Ergani, road 1 km NE Salihli, 38°14'N, 39°40'E, 12.IV.2008, leg. Yağmur (cAnl); 1 ex., Eğil, 1 km SW Kalkan, 38°09'N, 40°04'E, 13.IV.2008, leg. Yağmur (cAnl).

**Israel**: 1 ex., Golan Heights, Bental Reservoir, W Merom Golan, ca. 1000 m, stony wetland, 30.IV.2006, leg. Wrase (cSch); 1 ex., same data, but stony pasture, 25.III.2008, leg. Wrase (cSch); 1 ex., S Hadera, Dreikhat Ya'ar, 32°25'N, 34°54'E, 10 m, ponds and wet meadows, IV.2007, leg. Assmann (cFel).

**Iran**: 1 ex., Ardabil, Sabalan Mts., 40 km SW Ardabil, Nir, 14.IV.1999, leg. Rejsek (SMNS).

**Kazakhstan**: 1 ex., Irtysh river, Lebyazh'e, 21.V.1979, leg. Kastcheev (cKas); 4 exs., Kurgaldzhino, Sultan-Keldy, 10.IV.1982, leg. Kastcheev (cAss); 1 ex., S-Kazakhstan, Syrdaria river, Chardara, 18.VI.1983, leg. Kastcheev (cAss).

Comment

*Leptobium gracile* is wing-dimorphic and the most widespread species of the genus, its distribution ranging from the Canary Islands to Middle Asia (Assing 2005).

#### *Leptobium turcmenicum* (Coiffait, 1967)

Additional material examined (total: 4 exs.)

**Kazakhstan**: 4 exs., Aral Sea region, Barsakel'mes island, 10.V.1979, leg. Kastcheev (cAss, cKas).

Comment

The distribution of this species is confined to Middle Asia (Turkmenistan, Uzbekistan, Kazakhstan) (Assing 2005).

#### *Leptobium illyricum* (Erichson, 1840)

Additional material examined (total: 41 exs.)

**Croatia**: 1 ex., Split (HNHM); 1 ex., Krivosije, leg. Paganetti (HNHM); 1 ex., Mljet island ["Meleda"], 1907, leg. Moczarski (NHMW); 2 exs., "Dalmatia", 1883, leg. Merkl (HNHM).

**Bosnia-Herzegovina**: 1 ex., Cemerno, leg. Grabowski (HNHM); 12 exs., Mostar, leg. Grabowski, Matzenauer, Zoufal (HNHM, cAss); 1 ex., Pluzine, leg. Grabowski (HNHM); 4 exs., locality not specified (HNHM).

**Yugoslavia**: 2 exs., Topla, leg. Paganetti (HNHM).

**Greece**: **Greek mainland**: 1 ex., Thesprotia, Igoumenitsa env., Plataria, VI.1994, leg. Frank (cAss). – **Pelopónnisos**: 1 ex., Korinthia, Chelmos, 1400 m, 22.IV.2005, leg. Arndt (cSch); 1 ex., Taygetos, 36°57'N, 22°22'E, 1500 m, 15.V.2007, leg. Lompe (cAss); 1 ex., Taygetos, 36°57'N, 22°21'E, 2250 m, 16.V.2007, leg.

LOMPE (cAss); 1 ex., Taygetos, W Mystras, Langada pass, 37°08'N, 22°18'E, 1520 m, *Abies cephalonica* forest, 21.IV.–7.V.2007, leg. SCHNITTER, ARNDT & NEUMANN (cApf); 1 ex., Erimanthos, above Kalentzi, 1550 m, 30.V.1995, leg. GIACHINO & VAILATI (cVai); 1 ex., Erimanthos, Lambia, NE Kalivia Astra, 37°55'N, 21°49'E, 1700 m, 4.V.2007, leg. APFEL (cApf). – **Corfu**: 3 exs., locality not specified, leg. PAGANETTI (HNHM); 1 ex., Corfu (BMNH). – **Kefallinia**: 2 exs., locality not specified (BMNH). – **Kyklades**: 1 ex., Ándros, Moni Panandrantou monastery, 5.IV.1991, leg. IGLESIAS (SMNS); 1 ex., Ándros, SW Ándros town, 4.IV.1991, leg. IGLESIAS (cAss).

**Turkey**: **Amasya**: 1 ex., 10 km N Mezitözü, 1000 m, 4.V.1987, leg. GIACHINO (cAss).

### Comment

*Leptobium illyricum* is one of the most widespread brachypterous species of the genus, its distribution ranging from Slovenia to Iran. For a map see ASSING (2005).

## *Leptobium syriacum* (Saulcy, 1864)

Additional material examined (total: 27 exs.)

**Turkey**: **Kahramanmaraş**: 1 ex., Türkoğlu, 3 km S Yeşilyöre, 37°25'N, 36°46'E, 9.III.2008, leg. YAĞMUR (cAnl); 1 ex., Türkoğlu, 3 km SW Kızıleniş, 37°22'N, 36°49'E, 9.III.2008, leg. YAĞMUR (cAnl); 1 ex., 5 km N Narlı, 37°28'N, 37°06'E, 7.III.2008, leg. YAĞMUR (cAnl). – **Antakya**: 1 ex., Altınözü, Narlica, 14.IV.2007 (cAnl); 1 ex., Hassa, Küreci, Zeytinoba road, 15.IV.2007, leg. YAĞMUR (cAnl); 1 ex., Hassa, road Çardak Yaylası, 36°51'N, 36°29'E, 25.IV.2008, leg. YAĞMUR (cAnl); 1 ex., Iskenderun, 1.V.2007 (cAnl). – **Gaziantep**: 1 ex., Islahiye, Hanağzı, 25.V.2007, leg. YAĞMUR & KOÇ (cAnl); 1 ex., Islahiye, Fevzipaşa, 37°06'N, 36°39'E, 530 m, 2.III.2008, leg. YAĞMUR (cAnl); 1 ex., Şehitkamil, Kartalyücesi Dağı, Bakırcan, 37°04'N, 36°55'E, 1100 m, 28.III.2008, leg. YAĞMUR (cAnl); 1 ex., Şehitkamil, Sof Dağı, Sofalıcı, 37°09'N, 37°08'E, 1260 m, 28.III.2008, leg. YAĞMUR (cAnl); 2 exs., Şehitkamil, 2 km SW Kartal vill., 37°05'N, 36°57'E, 1100 m, 28.III.2008, leg. YAĞMUR (cAnl); 1 ex., Islahiye, Kabaklar, 37°02'N, 36°34'E, 835 m, 22.III.2008, leg. YAĞMUR (cAss).

**Israel**: 2 exs., Khermon Mts., Khermon Ridge, Har Khavushit, below lift station, 33°18'N, 35°48'E, 2500 m, stony subalpine slopes, 23.IV.2006, leg. WRASE (cSch, cAss); 2 exs., same data, but ca. 2000 m, leg. ASSMANN (cFel); 5 exs., Khermon Mts., Khermon Ridge, Har Khavushit, 1800 m, small *Quercus libani* forest, leaf litter sifted, 10.III.2008, leg. WRASE (cSch, cAss); 1 ex., Khermon Mts., 1800 m, 10.III.2008, leg. BUSE (cFel); 1 ex., North district, Upper Galilee, Alma plateau, S Alma village, Alma cave environs, 33°02'N, 35°31'E, 630 m, stony pasture, under stone, 9.III.2008, leg. WRASE (cSch); 2 exs., Sea of Galilee, Capernaum, 32°53'N, 35°35'E, 3.II.2007, leg. FELDMANN (cFel).

### Comment

The distribution of this species is confined to the Middle East, including Cyprus and central southern Anatolia. For a distribution map see ASSING (2005).

## *Leptobium densiventre* (Fauvel, 1875)

Additional material examined (total: 4 exs.)

**Algeria**: 3 exs., Algier, 1861, leg. GRAY (HNHM, cAss).
**Tunisia**: 1 ex., Zaghouan, leg. UJHELYI (HNHM).

### Comment

The distribution of *L. densiventre* includes North Africa from Libya to Algeria and Sicily (ASSING 2005).

## *Leptobium juani* Coiffait, 1969 (Fig. 11)

Additional material examined (total: 1 ex.)

**Spain**: 1 ex., Valencia, Alicante, Sierra d'Aitana, ca. 8 km N Sella, 38°39'N, 0°16'W, 1390 m, N-slope, sifted from grass roots and moss, 28.III.2007, leg. ASSING (cAss).

### Comment

*Leptobium juani* is a local endemic in Alicante, southeastern Spain (Fig. 11).

## *Leptobium colasi* (Coiffait, 1954) (Fig. 11)

Additional material examined (total: 4 exs.)

**Spain**: 3 exs., "Malpica" (MNCN, cAss); 1 ♀, Estremadura, Cáceres, Castillo de Monfragüe, 39°49'N, 6°03'W, 300–380 m, 30.III.2007, leg. FRENZEL (cApf).

### Comment

The distribution of *Leptobium colasi* is confined to the south of the Iberian Peninsula; its exact limits are unknown. All the records from Spanish provinces other than Andalucía (Estremadura, Castilla-León, Aragón) are based on females (Fig. 11) and consequently require verification. The locality "Malpica" is ambiguous.

## *Leptobium paivae* (Wollaston, 1865)

Additional material examined (total: 49 exs.)

**Portugal**: **Selvagens**: 49 exs., Selvagem Grande (SW), Levada do Cemitério, under stones (phonolith) on moist soil, 16.XI.–2.XII.2006, leg. PUTZER (cAss).

### Comment

*Leptobium paivae* is one of the two endemic species of Staphylinidae of the Selvagens islands (ASSING & SCHÜLKE

2006). The above specimens represent the first record after approximately 80 years (Assing 2005). They were collected in considerable numbers immediately after heavy rainfall. When the locality was re-visited several days later, no additional specimens were found (Putzer, pers. comm.).

*Leptobium nigricolle nigricolle* (Wollaston, 1862)

Additional material examined (total: 5 exs.)

**Spain**: **Canary Islands**: 1 ex., Lanzarote, Teguise, under stone, IV.2007 (cAss); 1 ex., Fuerteventura, NE Pájara, Vega de Rio Palmas, 23.XI.1993, leg. Grimm (SMNS); 1 ex., Fuerteventura, Peninsula de Jandia, Risco del Paso, 25.XI.1993, leg. Grimm (cAss); 2 exs., La Graciosa, Mña Mojón (Caldera), 3.XII.2004, leg. GIET (cOro, cAss).

Comment

The distribution of this subspecies is confined to Lanzarote, Fuerteventura, and some smaller adjacent islands of the Canarian archipelago (Assing 1999, 2005).

*Leptobium nigricolle canariense* (Fauvel, 1898)

Additional material examined (total: 2 exs.)

**Spain**: **Canary Islands**: 2 exs., Gran Canaria, Bco. de Las Palmas, Aldea Blanca, 29.XII.2007, leg. López (cOro).

Comment

This subspecies is endemic to – and rather common in – Gran Canaria, Canary Islands (Assing 1999, 2005).

*Leptobium nigricolle continentale* Jarrige, 1952

Additional material examined (total: 1 ex.)

**Morocco**: 1 ex., locality not specified (HNHM).

Comment

This is the only subspecies of *L. nigricolle* distributed outside the Canary Islands; its distribution is confined to northwestern Morocco (Assing 2005).

*Leptobium debilipenne* (Wollaston, 1865)

Additional material examined (total: 2 exs.)

**Spain**: **Canary Islands**: 1 ex., La Gomera, Los Acebiños, MSS trap, 3.I.2003, leg. Oromí & Contreras (cOro); 1 ex., locality not specified (HNHM).

Comment

*Leptobium debilipenne* is endemic to La Gomera, Canary Islands (Assing 1999, 2005).

*Leptobium korbi* (Eppelsheim, 1891)

Additional material examined (total: 1 ex.)

**Spain**: **Andalucía**: 1 ex., Algeciras, IV.1906 (SMF).

Comment

The known distribution of this species is confined to the province of Cádiz in southern Andalucía, Spain (Assing 2005).

*Leptobium artum* (Karsch, 1881)

Additional material examined (total: 3 exs.)

**Morocco**: 2 exs., Taza, ca. 30 km SE Tissa, 34°14'N, 4°27'W, 450 m, 23.II.2004, leg. Assmann (cAss, cSta); 1 ex., Tanger, road to Melloussa, 35°48'N, 5°42'W, 60 m, 27.III.2008, leg. Andújar et al. (cAss).

Comment

The above specimens from Taza are at the lower end of the size range and of uniformly dark brown to blackish brown coloration, but this is apparently an artefact resulting from post-mortem storage treatment. The species is distributed in North Africa, from Morocco to Libya. In Morocco, it is confined to the northern portion of the country (Assing 2005).

*Leptobium creticum* Coiffait, 1973

Additional material examined (total: 8 exs.)

**Greece**: **Crete**: 1 ex., Rethimni, beach near Dramia, 35°21'N, 24°20'E, 22.X.2006, leg. Schülke (cSch); 2 exs. [1 teneral], Rethimni, Ida range, 7.5 km S Anogia, 35°15'N, 24°53'E, 1200 m, 21.X.2006, leg. Schülke (cSch, cAss); 1 ex., Rethimni, ca. 1.5 km S Kanevos, Kotsifos cleft, 35°14'N, 24°24'E, 440 m, 20.X.2006, leg. Schülke (cSch); 1 ex., Rethimni, Lavris, under stone, 14.IV.2006, leg. Ausmeier (cAss); 1 ex., locality not specified, V.1965, leg. Kritscher (NHMW); 1 ex., Chora Sfakion, 21.IV.1971, leg. Wewalka (BMNH); 1 ex., Psiloritis plain, Analipsis, under stone, 15.IV.2006, leg. Ausmeier (cAss).

Comment

*Leptobium creticum* is endemic to Crete (Assing 2005). One specimen collected in October is teneral.

*Leptobium tauricum* Gusarov, 1988
(Fig. 12)

Additional material examined (total: 29 exs.)

**Ukraine**: 4 exs., Crimea, Alushta distr., Izobilnoye, 600 m, under stones, 6.V.2006, leg. Gontarenko (cAss).

**Turkey**: **Izmir**: 15 exs., ca. 80 km NW Izmir, W Karaburun, 38°38'N, 26°29'E, 440 m, pasture with stones on limestone, under stones, 4.IV.2006, leg. Assing (cAss). – **Çanakkale**: 10 exs., "Port Baklar" [ca. 40°33'N, 26°44'E], leg. Walker (BMNH, cAss).

Comment

The known distribution of *L. tauricum* is remarkably patchy. The species is now known from the Crimean peninsula (Ukraine) and from three localities in western Anatolia (Bursa, Izmir, Çanakkale) (Fig. 12). It is herein recorded from Çanakkale for the first time.

*Leptobium assingi* Bordoni, 1994
(Fig. 12)

Additional material examined (total: 3 exs.)

**Turkey**: **Osmaniye**: 1 ex., N Bahçe, Bekdemir, 37°16'N, 36°36'E, 1200 m, 21.IV.2007, leg. Brachat & Meybohm (cAss). – **Kahramanmaraş**: 2 exs., Başkonuş Yaylası, 37°33'N, 36°35'E, 1550 m, 24.IV.2007, leg. Brachat & Meybohm (cAss).

Comment

The known distribution of *L. assingi* is confined to southern Anatolia, ranging discontinuously from eastern Antalya to Gaziantep and Antakya (Fig. 12).

*Leptobium wunderlei* Bordoni, 1994

Additional material examined (total: 2 exs.)

**Turkey**: **Antalya**: 2 ♀♀, Köprü valley, Çaltepe, 37°18'N, 31°11'E, 540 m, 13.IV.2008, leg. Brachat & Meybohm (cAss).

Comment

The known distribution of the species is confined to Antalya (Assing 2005).

*Leptobium bicarinatum* Assing, 2005

Additional material examined (total: 13 exs.)

**Turkey**: **Gaziantep**: 1 ex. [with reddish pronotum], Karataş, 37°01'N, 37°23'E, 700 m, 13.V.2007, leg. Yağmur (cAnl); 1 ex., 1 km N Şahinbey, 12.XI.2006, leg. Anlaş (cAnl); 1 ex., 2 km S Şahinbey, 17.III.2007, leg. Anlaş (cAnl); 2 exs., Şahinbey, Ozanlı, 17.III.2007, leg. Anlaş (cAnl). – **Kilis**: 2 exs. [with reddish pronotum], Çörten, 29.IV.2006, leg. Yağmur (cAnl); 2 exs. [with reddish pronotum], 1 km W Çanak, Elbeyli, 17.III.2007 (cAnl, cAss); 1 ex., Oruçlu, 23.IV.2007, leg. Yağmur (cAnl). – **Antakya**: 1 ex., Belen Geçidi, 2.5 km N Kıcı, 36°30'N, 36°14'E, 950 m, 9.V.2008, leg. Yağmur (cAnl); 1 ex., Yayladağı, 3 km N Leylekli, 35°59'N, 36°03'E, 670 m, 17.V.2008, leg. Yağmur (cAnl); 1 ex., Kavalcık, Reyhanlı, 26.IV.2007, leg. Anlaş (cAnl).

Comment

*Leptobium bicarinatum* was previously known only from Antakya province, central southern Anatolia, and Syria (Assing 2005). It is herein reported from Gaziantep and Kilis provinces for the first time.

*Leptobium mutabile* Assing, 2005

Additional material examined (total: 1 ex.)

**Turkey**: **Antalya**: 1 ♀, Alanya env., Sapadera, leg. Franz (NHMW).

Comment

The known distribution of this species is confined to Antalya province, southwestern Turkey (Assing 2005).

*Leptobium bozdagense* Assing, 2006

Additional material examined (total: 8 exs.)

**Turkey**: **Manisa**: 1 ex., Turgutlu, Baktırlı, 11.III.2007, leg. Anlaş (cAnl); 1 ex., 8 km E Turgutlu, Çıkrıkçı, 38°28'N, 27°49'E, 300 m, 22.II.2007, leg. Anlaş (cAnl); 1 ex., same data, but 15.II.2006 (cAss); 1 ex., Turgutlu, Bozkır, 2.II.2007, leg. Anlaş (cAss); 1 ex., Turgutlu, Ovacık, Dağmarmara, 11.III.2007, leg. Anlaş (cAss); 1 ex., Bozdağ, Subatan Y., 1.IV.2006, leg. Anlaş (cAss). – **Izmir**: 2 exs. [det. Anlaş], Boz Dağlar, Ödemiş, 5 km SE Horzum, Subatan river bank, 21.V.2006, leg. Anlaş (cAnl).

Comment

The above specimens represent the first records since the original description, which is based on a single male. The known distribution is confined to the Boz Dağlar in Manisa and Izmir provinces, western Turkey.

*Leptobium drusiacum* Coiffait, 1969

Additional material examined (total: 3 exs.)

**Israel**: 3 exs., Khermon Ridge, Har Khavushit, N Majdal e-Shams, 33°17'N, 35°46'E, 1500 m, 25.II.2005, leg. Starke (cAss, cFel, cSta).

Comment

The species was previously known only from the Djebel Cheik (Mount Hermon) at the border between Lebanon and Syria (Assing 2005). It is herein reported from Israel for the first time.

*Leptobium obesum* (Fauvel, 1875)

Additional material examined (total: 2 exs.)

**Lebanon**: 1 ex., prov. N-Lebanon, Bcharre, Jabal et Mekmel, 34°13'N, 36°04'E, 2500–2800 m, near snowfields, 27.V.2006, leg. Frenzel (cApf); 1 ex., locality not specified, leg. Piochard (BMNH).

Comment

The known distribution of *L. obesum* is confined to Lebanon and Israel (Assing 2005).

## 3.2 Descriptions of new species

*Leptobium castroi* **n. sp.**
(Figs. 1–4, 11)

Type material

Holotype ♂: "E – Jaén, Valdepeñas, La Pandera, 2.V.2007, leg. A. Castro / Holotypus ♂ *Leptobium castroi* sp. n. det. V. Assing 2008" (cAss).

Paratype ♀: same data as holotype (cAss).

Etymology

The species is dedicated to Alejandro Castro Tovar, Jaén, who collected the type specimens.

Description

Measurements (in mm) and ratios (holotype, paratype): HL: 1.00, 0.99; HW: 0.91, 0.87; PW: 0.91, 0.90; PL: 1.09, 1.04; EL: 0.74, 0.69; TiL: 0.84, 0.82; TaL: –, 0.72; ML: 1.36, –; TL: 7.2, 7.3; HL/HW: 1.10, 1.14; PW/HW: 1.00, 1.04; PL/PW: 1.20, 1.16; EL/PL: 0.68, 0.66; TiL/TaL: –, 1.14.

Habitus as in Fig. 1. Coloration: head, pronotum, and abdomen, except for the apex, blackish-brown; elytra and abdominal apex (posterior half of segment VII, segments VIII–X) dark reddish; legs and antennae rufous.

Head moderately oblong (see ratio HL/HW), with sparse and relatively fine punctation; microsculpture absent; eyes approximately half as long as postocular region in dorsal view (Fig. 2).

Pronotum approximately as wide as head (see ratio PW/HW); punctation similar to that of head (Fig. 2).

Elytra approximately as wide as, and at suture distinctly shorter than pronotum (see ration EL/PL); punctation similar to that of head and pronotum; microsculpture absent (Fig. 2). Hind wings reduced.

Abdomen subparallel, at segment VI 1.05–1.10 times as wide as elytra; punctation dense, rather fine, and shallow; integument with shallow transverse microsculpture; posterior margin of tergite VII with narrow rudiment of a palisade fringe.

♂: sternite VIII with the usual deep and narrow posterior incision; aedeagus as in Figs. 3–4, dorsal plate with pronounced median carina.

Comparative notes

The geographically closest congeners of similar size and coloration are *L. juani* (Alicante) and *L. colasi* (south of Iberian peninsula, with some tentative, female-based records also from Castilla-León and Estremadura). From both species, *L. castroi* is distinguished by the more extensively darkened abdominal segment VII and additionally as follows:

from *L. juani* by the smaller and more slender aedeagus with a ventral process of different shape and a more slender dorsal plate;

from *L. colasi* by the longer and more slender dorsal plate of the aedeagus, the presence of only one median carina on the dorsal plate (in *L. colasi* the carina is doubled), and the completely different shape of the ventral process.

From *L. densiventre* (North Africa, Sicily), the new species is separated by the sparser punctation of the forebody, the less extensively darkened abdominal segment VII, as well as by the slightly smaller and somewhat more slender aedeagus with a ventral process of slightly different shape.

Distribution and bionomics

The type locality is situated in the Sierra de la Pandera, to the south of the town of Jaén, Andalucía, Spain (Fig. 11). Bionomic data are not available.

*Leptobium anlasi* **n. sp.**
(Figs. 5–10, 12)

Type material

Holotype ♂: "16.XII.2006, Korubaşı [38°47'N, 28°14'E], Gördes, Manisa / Holotypus ♂ *Leptobium anlasi* sp. n. det. V. Assing 2008" (cAss).

Paratypes: 2♂♂: same data as holotype (cAnl, cAss); 1♂: "18.XI.2006, Beyler [ca. 38°40'N, 28°00'E], Gölmarmara, S. Anlaş" (cAss).

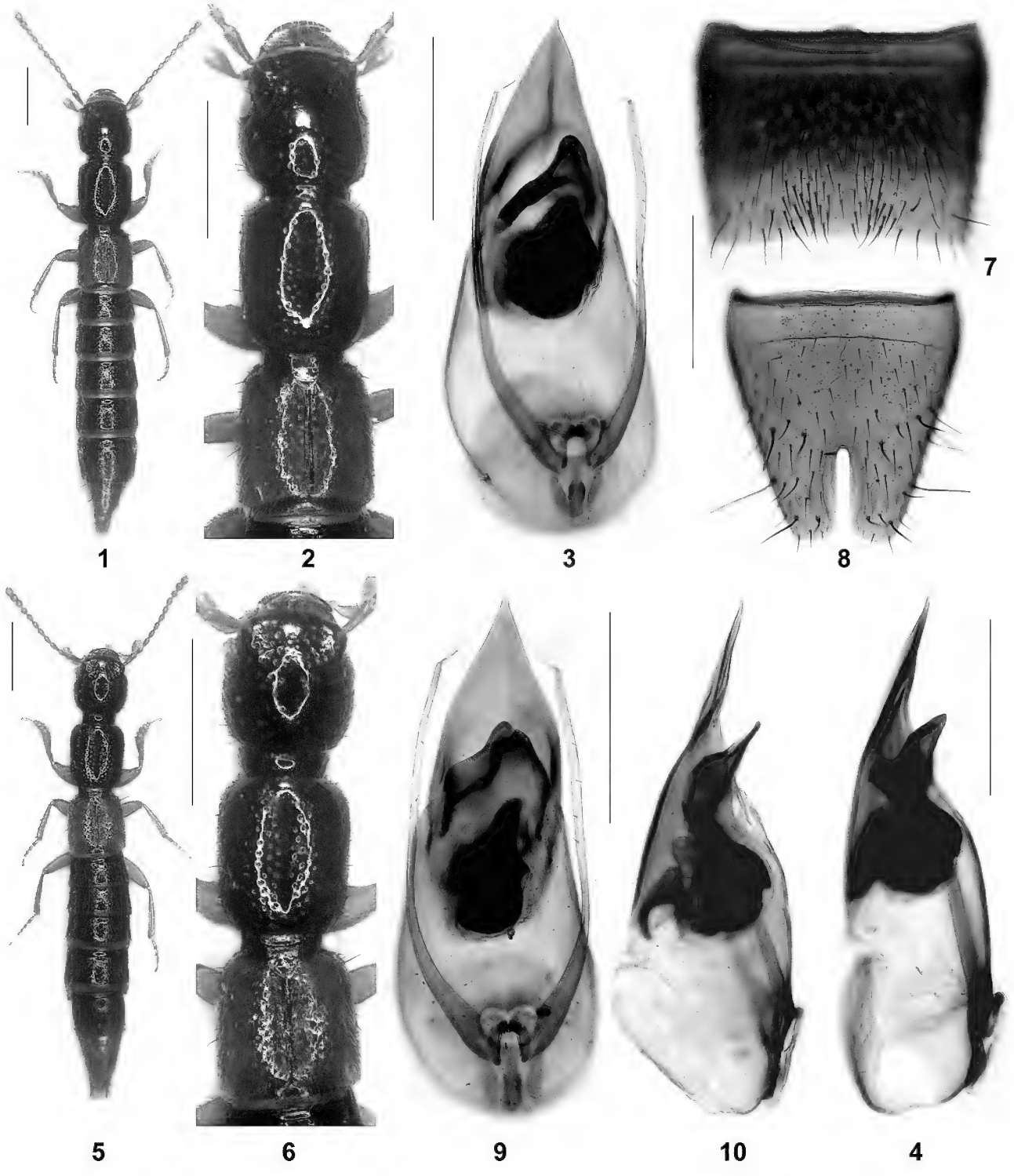
Etymology

The species is dedicated to Sinan Anlaş, Turgutlu, who collected the type series.

Description

Measurements (in mm) and ratios (range; n = 4): HL: 0.82–0.87; HW: 0.76–0.84; PW: 0.76–0.84; PL: 0.91–0.97; EL: 0.62–0.64; TiL: 0.70–0.74; TaL: 0.64–0.66; ML: 1.09–1.19; TL: 6.1–7.0; HL/HW: 1.02–1.08; PW/HW: 0.98–1.03; PL/PW: 1.12–1.19; EL/PL: 0.66–0.68; TiL/TaL: 1.09–1.10.

Habitus as in Fig. 5. Coloration: head and pronotum black; elytra reddish; abdomen black, with the apex (posterior ¼–⅓ of segment VII and segments VIII–X) rufous; legs and antennae yellowish-brown to reddish-yellow.




**Figs. 1–10.** *Leptobium castroi* n. sp. (1–4) and *L. anlasi* n. sp. (5–10), holotypes. – **1**, **5**. Habitus. **2**, **6**. Forebody. **3**, **9**. Aedeagus in ventral view. **4**, **10**. Aedeagus in lateral view. **7**. Male sternite VII. **8**. Male sternite VIII. – Scale bars: 1.0 mm (1–2, 5–6), 0.5 mm (3–4, 7–10).

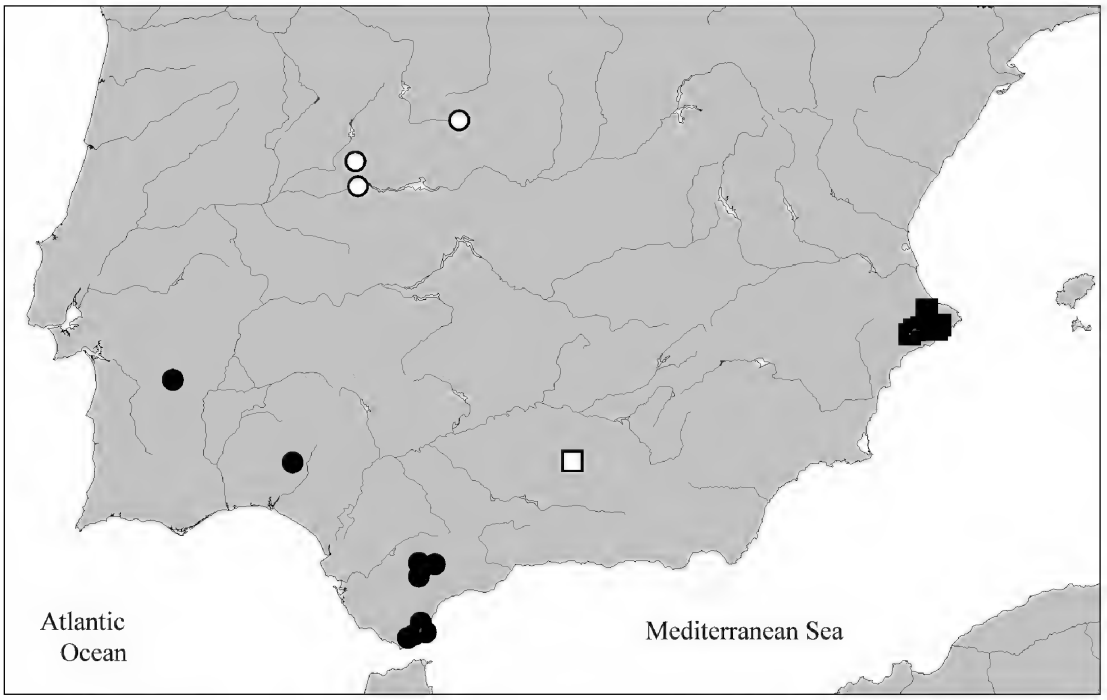



**Fig. 11.** Distributions of *Leptobium colasi* (Coiffait) (● = male-based records, ○ = female-based records), *L. juani* Coiffait (■), and *L. castroi* n. sp. (□) in Spain.

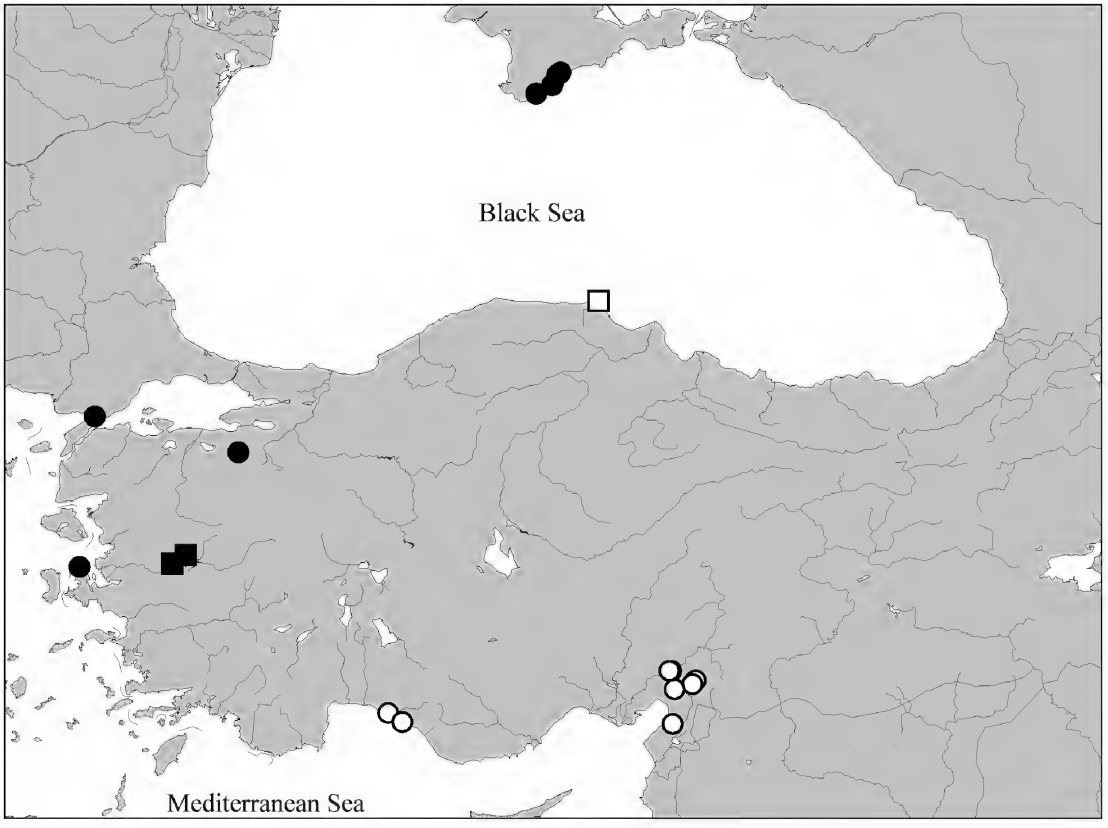



**Fig. 12.** Distributions of *Leptobium tauricum* Gusarov (●), *L. assingi* Bordoni (○), *L. ponticum* Assing (□), and *L. anlasi* n. sp. (■) in Turkey and Ukraine.

Head weakly oblong (see ratio HL/HW); dorsal surface with coarse, moderately dense punctation and with interspersed micropunctures; microsculpture absent; eyes approximately 0.5–0.7 times as long as postocular region in dorsal view (Fig. 6).

Pronotum approximately as wide as head (see ratio PW/HW); punctation similar to that of head or slightly finer (Fig. 6).

Elytra (Fig. 6) slightly wider and at suture distinctly shorter than pronotum (see ratio EL/PL); punctation of similar density as that of pronotum, but shallower and less defined; microsculpture absent. Hind wings reduced.

Abdomen subparallel, at segments VI and VII approximately 1.1 times as wide as elytra; punctation shallow and moderately fine; integument with microsculpture composed of predominantly isodiametric (posterior tergites) and transverse meshes (anterior tergites); posterior margin of tergite VII without palisade fringe.

♂: sternite VII with weakly concave posterior margin, posteriorly with cluster of dark setae on either side of middle (Fig. 7); sternite VIII with posterior incision almost ⅓ the length of sternite (Fig. 8); aedeagus as in Figs. 9–10, dorsal plate apically very acute.

### Comparative notes

From other congeners of similar size and coloration recorded from Turkey (*L. tauricum*, *L. ponticum*, *L. assingi*), the new species is distinguished as follows:

from *L. tauricum* (western and northwestern Anatolia; Fig. 12) by the smaller and more slender body, by the less extensively infuscate segment VII, and by the completely different shape of the ventral process and the dorsal plate of the aedeagus;

from *L. ponticum* Assing (known only from Sinop; Fig. 12) by the different shape of the ventral process and the dorsal plate of the aedeagus (both in ventral and in lateral view);

from *L. assingi* Bordoni (southern Anatolia; Fig. 12) by the less deep posterior incision of the male sternite VIII and by the differently shaped (more asymmetric) ventral process of the aedeagus.

For illustrations of the above species see Assing (2005).

### Distribution and bionomics

The species is currently known only from two localities in Manisa province, western Anatolia, Turkey (Fig. 12). The type specimens were collected in November and December.

## *Leptobium vitalyi* **n. sp.**
(Figs. 13–18)

### Type material

Holotype ♂: "Kazakhstan, Aral sea region, Barsakel'mes isl., 6.V.1979, V. Kastcheev / Holotypus ♂ *Leptobium vitalyi* sp. n. det. V. Assing 2008" (cAss).

Paratypes: 2♀♀: same data as holotype (cAss); 1♂: "S Kazakhstan, Syrdaria riv., Akkum, 11.VI.1985, V. Kastcheev" (cAss); 1♂, 1♀: "Kazakhstan, Ile riv., Karagach, 6.VII.1981, V. Kastcheev" (cAss, cKas); 2♀♀: "Kazakhstan, Ile river, splav, 1x4, 31.VII.1982, V. Kastcheev" (cAss, cKas); 1♀: "Kazakhstan, Ile river, Bakanas, 2.VI.1989, V. Kastcheev" (cKas); 1♀: "Kazakhstan, Ile river, Buryndysu, 10.VI.1982, V. Kastcheev" (cAss).

### Etymology

The species is dedicated to Vitaly Kastcheev, Almaty, who collected the type series.

### Description

Measurements (in mm) and ratios (range; n = 8): HL: 0.68–0.74; HW: 0.52–0.68; PW: 0.66–0.74; PL: 0.78–0.87; EL: 0.70–0.84; TiL: 0.58–0.66; TaL: 0.49–0.56; ML: 0.87–0.91; TL: 4.4–5.4; HL/HW: 1.06–1.17; PW/HW: 1.03–1.13; PL/PW: 1.15–1.24; EL/PL: 0.87–1.00; TiL/TaL: 1.11–1.28.

Habitus as in Fig. 13. Coloration: forebody yellowish-red to dark reddish, rarely with the anterior margin of the elytra weakly infuscate; abdomen dark brown to blackish, with the apex (posterior margin of segment VII, segments VIII–X) reddish-brown; legs and antennae dark yellowish to reddish.

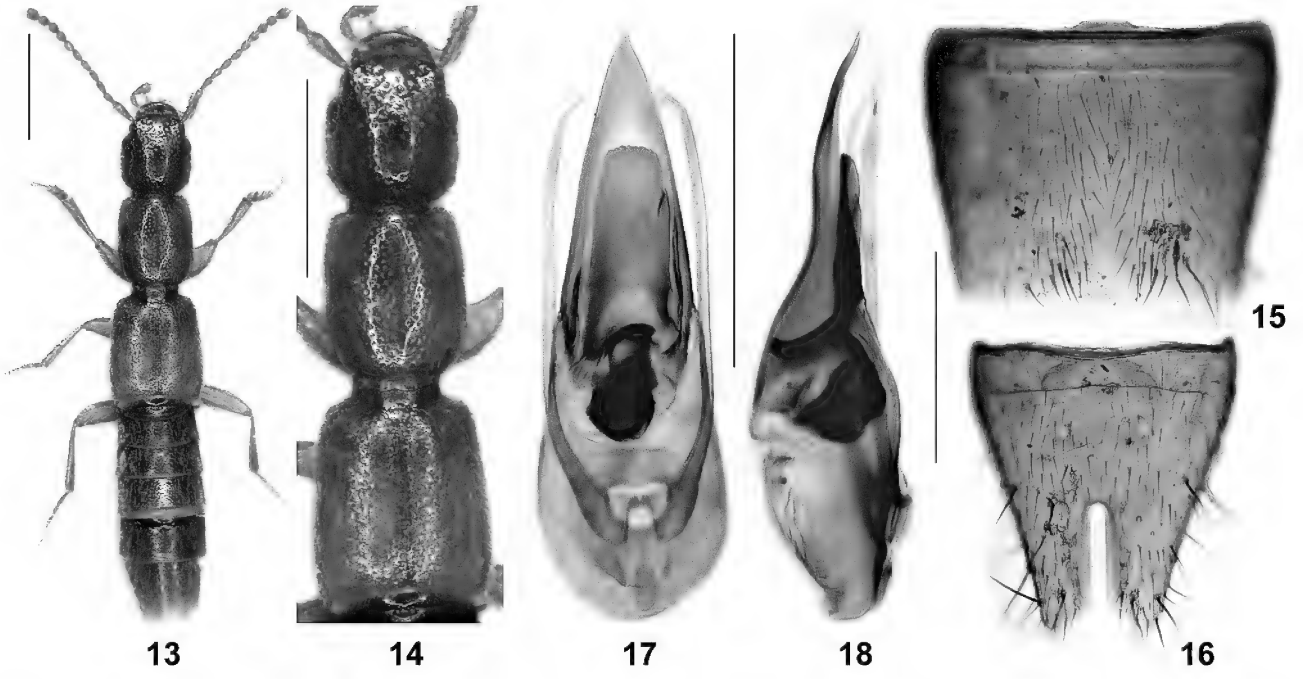
Head moderately oblong (see ratio HL/HW); dorsal surface with coarse, moderately dense punctation and with interspersed micropunctures; microsculpture absent; eyes slightly more than half as long as postocular region in dorsal view (Fig. 14).

Pronotum slightly wider than head (see ratio PW/HW); punctation similar to that of head (Fig. 14).

Elytra distinctly wider than pronotum, at suture as long as pronotum or nearly so (see ratio EL/PL); punctation denser, shallower, finer, and less defined than that of pronotum; microsculpture absent (Fig. 14). Hind wings present.

Abdomen subparallel, noticeably narrower than elytra; punctation fine and moderately dense; integument with very shallow microsculpture and somewhat glossy; posterior margin of tergite VII with palisade fringe.

♂: sternite VII with small triangular median impression posteriorly, on either side of this depression with cluster of few dark and long setae (Fig. 15); sternite VIII




**Figs. 13–18.** *Leptobium vitalyi* n. sp., holotype. – **13**. Habitus. **14**. Forebody. **15**. Male sternite VII. **16**. Male sternite VIII. **17–18**. Aedeagus in ventral and lateral view. – Scale bars: 1.0 mm (13–14), 0.5 mm (15–18).

with posterior incision almost reaching middle of sternite (Fig. 16); aedeagus as in Figs. 17–18.

### Comparative notes

The only species with a similar aedeagus is *L. dimidiatum* (Gridelli, 1926) (Romania, Georgia, Turkmenistan) of the *L. gracile* group. From this species, *L. vitalyi* is readily distinguished by smaller size (no overlap), different coloration (*L. dimidiatum*: head, pronotum, and abdomen black; elytra bicoloured, with the anterior ⅓ black and the posterior area reddish), a different shape and chaetotaxy of the male sternite VII (*L. dimidiatum*: more pronounced clusters of setae at posterior margin, posterior margin in the middle more broadly and strongly produced), as well as a much smaller and more slender aedeagus (*L. dimidiatum*: 1.13–1.26 mm long) with a relatively longer and more slender ventral process. For illustrations of the aedeagi of *L. dimidiatum* and of other species of the *L. gracile* group see Assing (2005).

### Distribution and bionomics

The known distribution is confined to southern Kazakhstan, from the Aral Sea in the west, to the region northeast of Almaty in the east. The type specimens were collected during the period from May through July.

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# *Ctesias (Tiresiomorpha) dakariensis* n. sp. (Coleoptera: Dermestidae) from the Republic of Senegal

Andreas Herrmann & Jiří Háva

Abstract

*Ctesias (Tiresiomorpha) dakariensis* **n. sp.** from the Republic of Senegal is described. A checklist of the dermestid species from the Republic of Senegal is provided.

Keywords: Taxonomy, new species, Coleoptera, Dermestidae, Megatomini, *Ctesias*, Republic of Senegal.

Zusammenfassung

*Ctesias (Tiresiomorpha) dakariensis* **n. sp.** aus der Republik Senegal wird beschrieben und die bis heute aus der Republik Senegal gemeldeten Dermestidenarten werden aufgelistet.

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## 1 Introduction

The genus *Ctesias* Stephens, 1830 includes 21 species worldwide (Háva 2003). Only a single species (*Ctesias (Tiresiomorpha) variegata* Arrow, 1915, was known before from the Afrotropical Region (Congo, Kenya and South Africa) (see Arrow 1915). Another one, *Ctesias (Decemctesias) morocco* Háva, 2000, was described from the African part of the Mediterranean (Morocco), and also the predominantly European species, *Ctesias (Ctesias) serra* (Fabricius, 1792), reaches North Africa in Algeria.

The new Afrotropical species which is described below was discovered by the authors among material of African Dermestidae stored in SMNS.

Abbreviations

| | |
|---|---|
| EW | elytral width = maximum elytral width |
| TL | total length = distance from anterior margin of pronotum to apex of elytra |
| SMNS | Staatliches Museum für Naturkunde, Stuttgart, Germany |

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The authors are indebted to Dr. Wolfgang Schawaller (Stuttgart, SMNS) for the loan of specimens and to Jean-Philippe Legrand (Paris) for his helpful comments concerning the handwritten parts of the label. Furthermore they want to thank Dr. Michael Geisthardt (Wiesbaden) as well as an anonymous referee for reading the manuscript.

## 2 *Ctesias (Tiresiomorpha) dakariensis* n. sp.

(Figs. 1, 3)

Holotype (♂): Republic of Senegal, M'Bao [about 15 km southeast of Dakar], 1946, leg A. Villiers, IFAN [Institut Français d'Afrique Noire]. The specimen was found under the bark of a rotten baobab (*Adansonia*).

The holotype is stored in SMNS.

Etymology

The name of the new species refers to Dakar, the capital of the Republic of Senegal, where the specimen was collected.

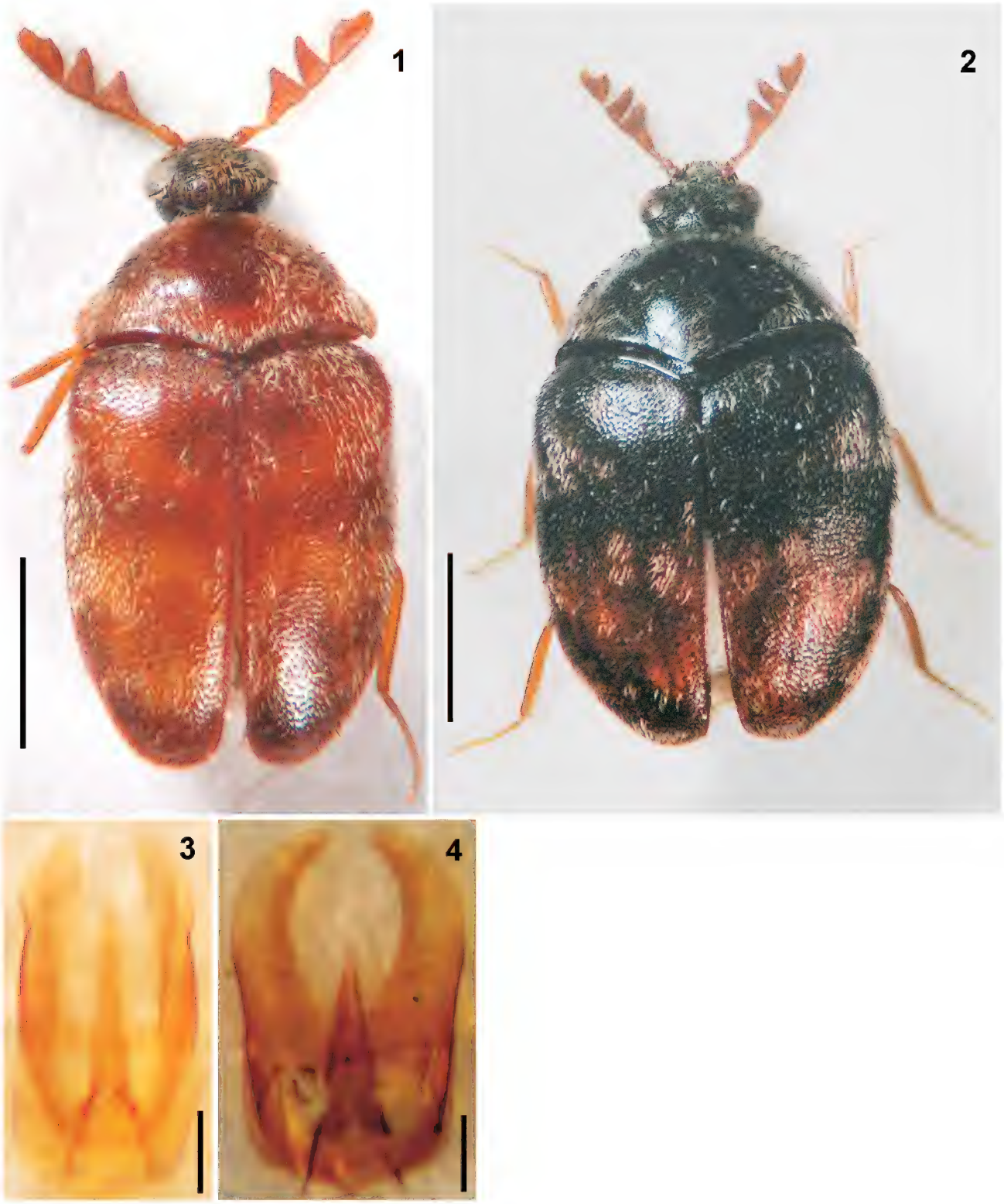
Description

Body (Fig. 1) elongate ovate, slightly arched.

Measurements: TL 2.9 mm, EW 1.7 mm.

Head broader than long, between eyes and antennae coarsely punctate, sparsely covered with procumbent long, strong and light brown hairs. Mentum with the same kind of hairs, clypeus slightly extended. Palpi entirely light brown. Ocellus present on front. Antennae entirely reddish brown, 11-segmented; antennal club with 3 antennomeres, 2.5 times as long as the other segments combined, the three segments of the club are strongly serrate on one side.

Pronotum reddish-brown with some blurred darker parts laterally and in the middle, twice as wide as long, strongly narrowed anteriorly, slightly narrowed posterior-




**Figs. 1–4.** *Ctesias* spp., habitus (1–2), aedeagus (3–4). – **1**, **3**. *C. dakariensis* n. sp., holotype. **2**, **4**. *C. variegata*. – Scale: 1 mm (1–2), 0.1 mm (3–4).

ly, broadest behind middle, fine and sparsely punctate with the same pubescence as the head. Anterior angles acute, but slightly rounded, not visible from above; posterior angles with rounded edge, middle of base convexly extended. Lateral antennal fossa present on the underside of the pronotum.

Scutellum small, triangular, with a very few light brown hairs; puncture hardly visible.

Elytra coarsely punctate, but not as dense as on the head. Cuticle reddish brown with three blurred yellow-brown horizontal fasciae, sparsely covered with the same kind of hairs as head and pronotum. Anterior fascia starting just behind the shoulders, the next fascia near the middle of the elytrae and the posterior fascia is located in the apical part. Punctation, pubescens and colour of the underside (mesosternum, metasternum and abdominal sternites) quite similar to the surface, somewhat darker brown on average.

Legs [right hind leg complete, tarsi of left fore and middle legs missing, all other legs entirely missing] light brown, sparsely covered with small, brown and slightly erect hairs. Hind tarsa about as long as hind tibia. All tibiae with two distinct small spines apically.

First abdominal segment without distinct oblique discal striae.

Male genitalia as in Fig. 3.

Female unknown.

### Differential diagnosis

According to the characters given by HÁVA (2004), the new species belongs into the subgenus *Tiresiomorpha* Pic, 1954. This subgenus includes five species which are distributed in the Palaearctic region (HÁVA 2007) and one species, *Ctesias variegata* Arrow, 1915, from the Afrotropical region (MROCZKOWSKI 1968, HÁVA 2003). The new species *Ctesias dakariensis* n. sp. differs from the other Afrotropical species, *C. variegata*, as follows:

**1** Body elongate ovate. Posterior pronotal angles visible from above. Antenna of male as in Fig. 1. Aedeagus as in Fig. 3. . . . . ***C. dakariensis* n. sp.**

– Body ovate. Posterior pronotal angles not visible from above. Antenna of male as in Fig. 2. Aedeagus as in Fig. 4. . . . . ***C. variegata***

## 3 Checklist of the Dermestidae from the Republic of Senegal

D e r m e s t i n i

*Dermestes (Dermalius) maximus* Pic, 1915
*Dermestes (Dermestinus) maculatus* DeGeer, 1774

T r i n o d i n i

*Trinodes senegalensis* Pic, 1915

A t t a g e n i n i

*Attagenus (Attagenus) cyphonoides* Reitter, 1881
= *Telopes senegalensis* Pic, 1915
*Attagenus (Attagenus) ensicornis* Wollaston, 1867
*Attagenus (Attagenus) fasciatus* (Thunberg, 1795)
*Attagenus (Attagenus) madoni* Pic, 1942
*Attagenus (Attagenus) postfasciatus* (Pic, 1951)
*Attagenus (Attagenus) posticalis* Fairmaire, 1879
*Attagenus (Attagenus) robustior* (Pic, 1951)

A n t h r e n i n i

*Anthrenus (Anthrenus) senegalensis* Pic, 1927

M e g a t o m i n i

*Ctesias (Tiresiomorpha) dakariensis* n. sp.
*Orphinus (Orphinus) fouqueti* Pic, 1937
*Thaumaglossa rufofasciata* (Pic, 1915)
*Trogoderma granarium* Everts, 1898

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# Revision der Gattung *Amarygmus* Dalman sowie verwandter Gattungen (Coleoptera: Tenebrionidae: Amarygmini). LI. Die Amarygmini der Philippinen

## Revision of the genus *Amarygmus* Dalman and related genera (Coleoptera: Tenebrionidae: Amarygmini). LI. The Amarygmini of the Philippines

Hans J. Bremer

Abstract

The Amarygmini of the Philippines are revised. The following new taxa are described: *Amarygmus abiectus* **n. sp.** (Luzon), *A. ambitiosus* **n. sp.** (Leyte), *A. antiquus* **n. sp.** (Leyte), *A. bakeri* **n. sp.** (Luzon), *A. boetticheri* **n. sp.** (Luzon, Samar, Mindanao), *A. dembickyi* **n. sp.** (Luzon), *A. dissimilis* **n. sp.** (Mindanao), *A. eremitis* **n. sp.** (Negros), *A. hylaeus* **n. sp.** (Mindanao), *A. iuventus* **n. sp.** (Luzon), *A. jaegeri* **n. sp.** (Leyte), *A. langeri* **n. sp.** (Romblon), *A. lugubris* **n. sp.** (Luzon), *A. mendicus* **n. sp.** (Luzon), *A. mindanaensis* **n. sp.** (Mindanao), *A. negrosensis* **n. sp.** (Negros), *A. nigellus* **n. sp.** (Leyte, Mindanao), *A. notabilis* **n. sp.** (Luzon), *A. oeneus* **n. sp.** (Luzon), *A. palawanensis* **n. sp.** (Palawan), *A. paradoxus* **n. sp.** (Luzon), *A. platolenoides* **n. sp.** (Leyte), *A. prolixus* **n. sp.** (Luzon), *A. pseudometallicus* **n. sp.** (Mindanao), *A. rugipectus* **n. sp.** (Panay), *A. schultzei* **n. sp.** (Luzon), *A. vicarius* **n. sp.** (Luzon), *A. vulcanus* **n. sp.** (Negros), *Dalmanius nanus* **n. sp.** (Luzon), and *Luzonoplonyx grandis* **n. gen., n. sp.** (Luzon).

Redescriptions, illustrations and remarks are given for several already known species of *Amarygmus*, *Caudamarygmus*, *Dalmanius*, and *Euspinamarygmus*.

A determination key for all species of the Philippine Amarygmini is provided.

Keywords: Coleoptera, Tenebrionidae, Amarygmini, *Amarygmus*, *Caudamarygmus*, *Dalmanius*, *Euspinamarygmus*, *Luzonoplonyx*, Philippines, new genus, new species.

Zusammenfassung

Die Amarygmini der Philippinen werden revidiert. Folgende neue Taxa werden beschrieben: *Amarygmus abiectus* **n. sp.** (Luzon), *A. ambitiosus* **n. sp.** (Leyte), *A. antiquus* **n. sp.** (Leyte), *A. bakeri* **n. sp.** (Luzon), *A. boetticheri* **n. sp.** (Luzon, Samar, Mindanao), *A. dembickyi* **n. sp.** (Luzon), *A. dissimilis* **n. sp.** (Mindanao), *A. eremitis* **n. sp.** (Negros), *A. hylaeus* **n. sp.** (Mindanao), *A. iuventus* **n. sp.** (Luzon), *A. jaegeri* **n. sp.** (Leyte), *A. langeri* **n. sp.** (Romblon), *A. lugubris* **n. sp.** (Luzon), *A. mendicus* **n. sp.** (Luzon), *A. mindanaensis* **n. sp.** (Mindanao), *A. negrosensis* **n. sp.** (Negros), *A. nigellus* **n. sp.** (Leyte, Mindanao), *A. notabilis* **n. sp.** (Luzon), *A. oeneus* **n. sp.** (Luzon), *A. palawanensis* **n. sp.** (Palawan), *A. paradoxus* **n. sp.** (Luzon), *A. platolenoides* **n. sp.** (Leyte), *A. prolixus* **n. sp.** (Luzon), *A. pseudometallicus* **n. sp.** (Mindanao), *A. rugipectus* **n. sp.** (Panay), *A. schultzei* **n. sp.** (Luzon), *A. vicarius* **n. sp.** (Luzon), *A. vulcanus* **n. sp.** (Negros), *Dalmanius nanus* **n. sp.** (Luzon) und *Luzonoplonyx grandis* **n. gen., n. sp.** (Luzon).

Nachbeschreibungen, Abbildungen und Anmerkungen werden gegeben zu einigen bereits bekannten Arten von *Amarygmus*, *Caudamarygmus*, *Dalmanius* und *Euspinamarygmus*.

Die Arbeit enthält eine Bestimmungstabelle für alle Arten der philippinischen Amarygmini.

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## 1 Einleitung

Die Tenebrionidae der Philippinen wurden bisher unzureichend untersucht. Neben mehreren Arbeiten, in denen einzelne Arten von den Philippinen beschrieben wurden, gibt es von GEBIEN Beiträge, die sich speziell mit den Tenebrioniden der Philippinen beschäftigen (GEBIEN 1913, 1921), und in denen er unter anderen vier *Amarygmus*-Arten beschrieb (zwei davon in der Gattung *Platolenes* Gebien, 1913). 1951 beschrieb KULZER mehrere *Amarygmus*-Arten der Philippinen als *Platolenes*. Ich selber habe vier *Amarygmus*-Arten (BREMER 2001b, 2002) sowie je eine Art der Gattungen *Caudamarygmus* Bremer, 2001 und *Dalmanius* Bremer, 2001 beschrieben (BREMER 2001b).

Auch in den letzten Jahrzehnten kam relativ wenig Material, speziell der Gattung *Amarygmus*, zur Bestimmung. Ich erwarte, dass die Zahl der noch zu beschreibenden Arten der Tribus Amarygmini Gistel, 1856 der Philippinen weit größer ist als die der anschließend behandelten Arten.

Die Amarygmini der Philippinen wurden nie zusammenfassend behandelt. Ihre Orginalbeschreibungen reichen häufig nicht aus, um die Arten zu erkennen, von nahezu allen Arten liegen keine adäquaten Abbildungen vor, die älteren Typen sind oft verschmutzt oder unzureichend präpariert, so dass man die wesentlichen Merkmale nicht erkennen kann, und viele der Arten sind einander sehr ähnlich. Daher habe ich mich entschlossen, eine zusammenfassende Bearbeitung der Gattungen und Arten mit Bestimmungsschlüssel und Abbildungen zu versuchen.

Von den Amarygmini sind bisher von den Philippinen 22 Arten der Gattung *Amarygmus* Dalman, 1823, eine Art der Gattung *Euspinamarygmus* Masumoto, 1989, eine Art der Gattung *Dalmanius* Bremer, 2001 und eine Art der Gattung *Caudamarygmus* Bremer, 2001 bekannt: *Amarygmus allectorius* Bremer, 2002; *A. angustus* Gebien, 1913; *A. breviculus* Bremer, 2001; *A. coloratus* (Kulzer, 1951) [beschrieben als *Platolenes coloratus* Kulzer, 1951]; *A. cuprarius* ssp. *cuprarius* (Weber, 1801) [beschrieben als *Helops cuprarius* Weber, 1801]; *A. cyaneipennis* Pic, 1938 [beschrieben als *Amarygmus micans* var. *cyaneipennis* Pic, 1938]; *A. elytralis* Bremer, 2001 [beschrieben als *Platolenes striatus* Kulzer, 1951]; *A. fragilis* Bremer, 2001; *A. inversus* Bremer, 2005 [beschrieben als *Platolenes rufipes* Gebien, 1913]; *A. latipes* (Kulzer, 1951) [beschrieben als *Platolenes latipes* Kulzer, 1951]; *A. longitarsis* Gebien, 1921; *A. metallicus* (Perty, 1831) [beschrieben als *Cnodalon metallicum* Perty, 1831]; *A. micans* (Fabricius, 1794) [beschrieben als *Chrysomela micans* Fabricius, 1794]; *A. pertyi* Bremer, 2001; *A. philippinensis* Gebien, 1944 [beschrieben als *Amarygmus filicornis* Gebien, 1921]; *A. planipennis* (Kulzer, 1951) [beschrieben als *Platolenes planipennis* Kulzer, 1951]; *A. plateni* Pic, 1951; *A. postdepressus* Pic, 1938; *A. pulcher* (Kulzer, 1951) [beschrieben als *Platolenes pulcher* Kulzer, 1951]; *A. schawalleri* Bremer, 2002; *A. spectabilis* (Gebien, 1921) [beschrieben als *Platolenes spectabilis* Gebien, 1921]; *A. trichosternum* Gebien, 1944 [beschrieben als *Amarygmus pilipectus* Gebien, 1921]; *Caudamarygmus notabilis* Bremer, 2001; *Dalmanius peregrinus* Bremer, 2001; und *Euspinamarygmus philippinensis* Masumoto, 1989.

In dieser Arbeit werden eine neue Gattung mit einer neuen Art, 28 neue Arten der Gattung *Amarygmus* Dalman, 1821 und eine neue Art der Gattung *Dalmanius* Bremer, 2001 beschrieben. Es werden außerdem Anmerkungen sowie – falls notwendig – Nachbeschreibungen und Abbildungen von früher beschriebenen Arten geliefert. Daneben werden Verwandtschaftsbeziehungen diskutiert und eine Bestimmungstabelle der philippinischen Arten entworfen.

Abkürzungen der Museen und Sammlungen

| | |
|---|---|
| CA | Sammlung Dr. K. ANDO, Osaka, Japan |
| CAN | Canadian National Insect Collection, Ottawa, Kanada |
| CL | Sammlung MICHAEL LANGER, Niederwiesa, Deutschland |
| CM | Sammlung Prof. Dr. K. MASUMOTO, Tokio, Japan |
| FAEU | Collection of the Faculty of Agriculture, Ehime University, Matsuyama, Japan |
| MNHP | Muséum National d'Histoire Naturelle, Paris, Frankreich |
| NHM | Natural History Museum, London, England |
| NHMB | Naturhistorisches Museum, Basel, Schweiz |
| NHMBF | Naturhistorisches Museum, Basel, Sammlung FREY, Schweiz |
| NHMG | Naturhistorisches Museum, Genf, Schweiz |
| NHMW | Naturhistorisches Museum, Wien, Österreich |
| NMHUB | Naturkunde Museum der Humboldt-Universität, Berlin, Deutschland |
| NSMT | National Science Museum (Natural History), Tokyo, Japan |
| SMNS | Staatliches Museum für Naturkunde, Stuttgart, Deutschland |
| SSB | Sammlung S. BEČVÁŘ, České Budějovice, Tschechien |
| TTM | Ungarisches Naturhistorisches Museum, Budapest, Ungarn |
| UNVS | University of Sydney, Macleay Museum, Australien |
| ZMK | Zoologisches Museum der Universität Kopenhagen (Sammlung FABRICIUS), Dänemark |
| ZSM | Zoologische Staatssammlung, München, Deutschland |
| ZSMB | Sammlung des Verfassers (jetzt im Besitz der Zoologischen Staatssammlung, München) |

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## 2 Morphometrie

Die Messungen wurden mit einer im Okular eingravierten Graduierung nach Eichung des Mikroskopes vorgenommen. Die Maße wurden wie folgt ermittelt:

| | |
|---|---|
| Körperlänge | vom Vorderrand des Halsschildes bis zum Ende der Flügeldecken |
| Körperbreite | breiteste Stelle der Flügeldecken |
| Flügeldeckenlänge | vom Vorderrand des Scutellums bis zum Ende der Flügeldecken |
| Halsschildlänge | median zwischen Vorder- und Hinterrand |

## 3 Beschreibungen neuer Arten der Gattung *Amarygmus*

### *Amarygmus abiectus* **n. sp.**
(Abb. 1A–H)

Holotypus (♂): Luzon, Pagbilao Prov., Quezon Nat. Park, 28.–29.V.1996, BOLM leg. (SMNS).

#### Etymologie

Abiectus (lat.) = dem Range nach niedrig, prosaisch.

#### Diagnose

Mittelgroß, länglich oval. Flügeldecken mit gering eingeschnittenen Striae, in letzteren kleine Punkte. Stirn mittelbreit. Fühler sehr lang und dünn. Beine mittellang. Protarsomeren 1–3 beim ♂ nicht verbreitert.

Gehört durch die Körperform und die langen, dünnen Fühler in die Artengruppe um *A. spectabilis* (Gebien, 1921), wobei die neue Art hinsichtlich Größe und Körperform besonders mit *A. negrosensis* n. sp. zu vergleichen ist. Bei *A. negrosensis* ist die Stirn aber wesentlich schmaler als bei *A. abiectus*, außerdem sind bei *A. negrosensis* Halsschild und Interstitien der Flügeldecken stärker punktiert.

Eine relativ breite Stirn wie bei *A. abiectus* besitzt *A. plateni* Pic, 1951 aus Mindanao, der nach PICS Angaben 10 mm lang ist. Diese Art gehört zu den wenigen Taxa, deren Typus mir bei der Beschreibung einer neuen Art nicht zum direkten Vergleich vorlag (weitere Angaben siehe unter *A. plateni*). Ich kann deshalb nicht völlig ausschließen, dass beide Arten synonym sein könnten, halte das aber für nicht sehr wahrscheinlich und beschreibe *A. abiectus* daher als separate Art. Zu einem späteren Zeitpunkt sollten aber Typen beider Taxa direkt miteinander verglichen werden.

#### Beschreibung

Maße: Länge 8,52 mm. Breite 4,70 mm. – Relationen: Breite/Länge des Halsschildes 1,73; Breite Hinterecken/Breite Vorderecken des Halsschildes 1,80. Länge/Breite der Flügeldecken 1,44; Länge Flügeldecken/Länge Halsschild 3,27; maximale Breite Flügeldecken/maximale Breite Halsschild 1,31.

Farbe: Oberseite braun, leicht glänzend (immatur?). Femora und Tibiae dunkelbraun, Tarsen heller braun. Fühler schwarzbraun. Unterseite braun, insgesamt matt (Sternite stärker als Metasternum).

Kopf: Stirn mittelbreit, etwas schmaler als die Länge des 4. Antennomers (wie 12:14). Wangen kurz, vor dem mittleren Teil der Stirnnaht endend, gering gewölbt. Stirnnaht leicht bogenförmig, gering eingeschnitten. Clypeus vorgezogen, leicht quer und längs gewölbt. Clypeus und Stirn dicht, fein, oberflächlich punktiert. Mandibeln apikal bifid.

Halsschild: Quer und längs deutlich gewölbt. Seiten in der basalen Hälfte subparallel, davor verrundet verengt. Vorderecken etwas akzentuiert, da die Vorderseite deutlich ausgeschnitten ist. Seiten durchgehend gerandet, Randung der Vorderseite in der Mitte unterbrochen. Bei Aufsicht sind die Randungen der Seiten in der ganzen Länge schmal sichtbar. Bei Ansicht von der Seite sind Vorder- und Hinterecken eckig, die Vorderecken rechtwinklig, die Hinterecken stumpfwinklig. Oberseite mit winzigen, weitläufig stehenden Pünktchen, wie unpunktiert wirkend.

Scutellum: Dreieckig, unpunktiert.

Flügeldecken: Eiförmig, stark gewölbt. Größte Breite und Höhe etwas vor der Mitte. Seiten zu den Schultern hin eingezogen. Enden der Flügeldecken gemeinsam verrundet. Seitenrandkanten von oben in den vorderen drei Viertel sehr schmal sichtbar. Auf der Oberseite feine, kaum eingeschnittene Striae; in ihnen finden sich kleine, meist leicht längliche Punkte, deren Abstände voneinander in der 4. Stria dem ½- bis 1-fachen ihrer Punktdurchmesser entsprechen; in der 4. Striae etwa 42 Punkte. Interstitien auf der Scheibe flach, seitlich hinten sehr leicht gewölbt, unpunktiert.

Prosternum: Vorderrand durchgehend schmal aufgebogen, median nicht zur Apophyse hin eingezogen. Apophyse schmal, deutlich kaudad vorgezogen, zwischen Vorderrand und Hüften etwas ansteigend, dahinter etwas abfallend; neben den Hüften die Seiten etwas verbreitert, dazwischen median keine deutliche Furche; hinter den Hüften die Seiten etwas verengt, dann aber über eine gewisse Strecke subparallel; apikal breit zugespitzt.

Mesosternum: Hinterer Teil am Vorderrand median etwas ausgeschnitten; der median dahinter liegende Teil besitzt eine glatte Oberfläche und ist gegenüber den Bereichen seitlich etwas angehoben; diese seitlichen Teile besitzen eine matte und etwas zerfurchte Oberfläche.

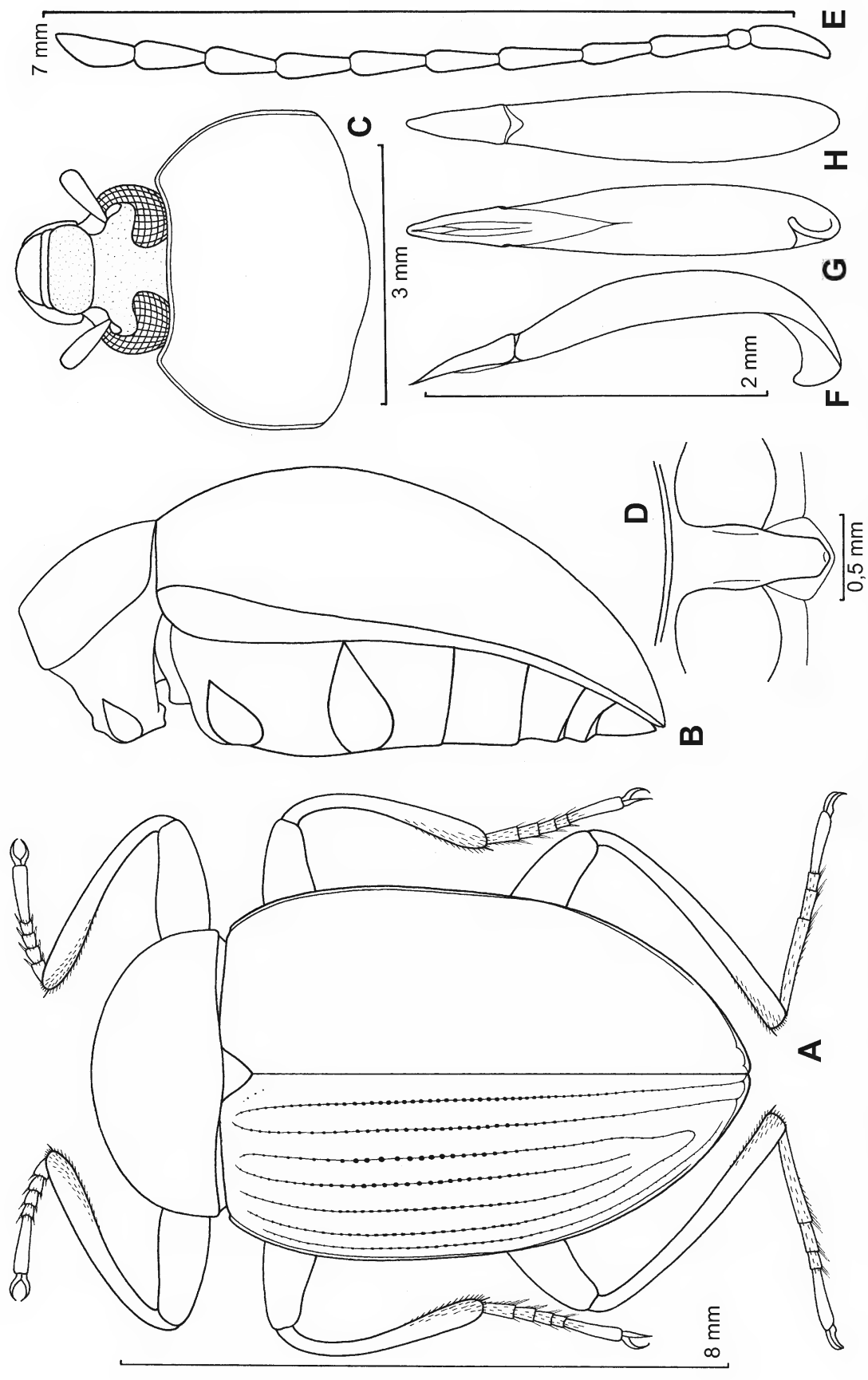


**Abb. 1.** *Amarygmus abiectus* n. sp. – **A** Habitus, ♂. **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Fühler. **F** Aedoeagus lateral. **G** Aedoeagus ventral. **H** Aedoeagus dorsal.

Metasternum: Vorderrand zwischen den Mesocoxae median gerade, erst seitlich gebogen, deutlich gerandet. Unpunktiert und kahl. Mediane Sutur in der ganzen Länge etwas eingeschnitten.

Sternite: Vorderrand des 1. Sternits zwischen den Metacoxae spitzbogig, schmal gerandet. Punktierung auf den Sterniten so undeutlich, dass Punkte schwierig auszumachen sind. Analsternit beim ♂ apikomedian leicht eingedrückt.

Fühler: Lang und dünn, zurückgelegt das letzte Viertel der Flügeldecken erreichend. Die Längen und Breiten der Antennomeren 1–11 verhalten sich wie 15:6 / 5:5 / 16:5½ / 14:5½ / 18:5½ / 16:5½ / 17:6 / 18:6 / 16:6 / 16:6 / 20:6.

Beine: Mittellang. Femora zum zweiten Drittel hin keulenförmig verdickt. Protibiae in der basalen Hälfte leicht gekrümmt, in der apikalen Hälfte etwas verdickt und gerade. Mesotibiae leicht gekrümmt. Metatibiae leicht gekrümmt. Die Längen der Protarsomeren 1–5 sind 5:5:5:4:20, die der Mesotarsomeren 1–5 sind 11:6:5:5:20, die der Metatarsomeren 1–4 sind 25:8:5:19.

Aedoeagus: Siehe Abb. 1F-H.

## *Amarygmus ambitiosus* **n. sp.**
(Abb. 2A–E)

Holotypus (♂): Philippines, Leyte, Visca N Baybay, sec. forest, 100–200 m, 5.III.1991, leg. Schawaller et al. (SMNS).

Paratypus: Tangcloan [=Tangcolan], Bukitnon [=Bukidnon], Baker, 1526; [Gebiens Handschrift] *Amarygmus ambitiosus* Geb. (1 NHMBF; der Käfer konnte nicht vom Plättchen abgelöst werden und die äußeren Merkmale erlauben keine Geschlechtsbestimmung).

### Etymologie

Ambitiosus (lat.) = anspruchsvoll, eitel. Ich übernehme den Namen, den Gebien (in litt.) für diese Art vorgesehen hatte.

### Diagnose

Klein, oval, stark gewölbt. Flügeldecken mit glänzenden farbigen Reflexionen, die sich etwas in Längsrichtung ordnen, Punktreihen großer Punkte und deutlich punktierten Interstitien. Fühler kurz. Stirn mittelbreit.

Ebenfalls dicht punktierte Interstitien hat *A. palawanensis* n. sp., bei dem sich wie bei *A. ambitiosus* die Farben auf den Flügeldecken in Längslinien ordnen können, jedoch stehen bei *A. ambitiosus* die Punkte der Interstitien weniger dicht, die Punkte der Reihen sind etwas größer und stehen auf der Scheibe etwas weiter auseinander, die Oberseite glänzt stärker und die Seiten der Flügeldecken sind etwas stärker verrundet.

Sehr ähnlich ist auch *A. steatitis* Bremer, 2005 von der Malayischen Halbinsel, der dieselbe Größe, Form und Färbung der Oberseite aufweist. Bei *A. steatitis* sind die Punkte der Punktreihen der Flügeldecken größer und weiter voneinander entfernt (bei *steatitis* 14 Punkte in der 4. Reihe, bei *A. ambitiosus* etwa 24 Punkte), die Fühler etwas kürzer und die Stirnnaht median schwach eingeschnitten (bei *A. ambitiosus* breit zum Clypeus hin eingedrückt, so dass der Clypeus bei *A. ambitiosus* längs gewölbt, bei *A. steatitis* eben ist).

### Beschreibung

Maße: Länge 5,81 + 6,09 mm. Breite 3,58 + 3,93 mm. – Relationen: Breite/Länge des Halsschildes 2,05 + 2,14; Breite Hinterecken/Breite Vorderecken des Halsschildes 1,90 + 1,93. Länge/Breite der Flügeldecken 1,32 + 1,35; Länge Flügeldecken/Länge Halsschild 3,47 + 3,74; maximale Breite Flügeldecken/maximale Breite Halsschild 1,29 + 1,31.

Farbe: Flügeldecken glänzend; je nach Winkel des Lichteinfalls entsprechen die Farben denen der Spektralfarben, wobei eine gewisse Tendenz besteht, dass sich die Farben in Längsrichtung ordnen. Halsschild schwarz mit leicht grünen Reflexionen, wegen dichter Punktierung nur schwach glänzend. Kopfoberseite, Beine (einschließlich Tarsen) und Fühler schwarz. Unterseite schwarz, glänzend. Mentum und Palpen braun.

Kopf: Stirn mittelbreit, etwas breiter als die gemeinsamen Längen der 2. und 3. Antennomeren (wie 21:20), gegen die Wangen und Stirnnaht durch deutliche Eindrücke begrenzt. Wangen kraniad, verglichen mit dem medianen Abschnitt der Stirnnaht, weiter vorreichend als die Stirnnaht, etwas gewölbt. Stirnnaht median eingedrückt. Clypeus längs gewölbt, aber der Höhepunkt der Wölbung bildet zusammen mit der Wölbung der Wangen einen halbkreisförmigen Bogen; bezogen auf die Wangen ist der Clypeus nicht sehr weit vorgezogen. Clypeus und Stirn glänzend, mit kleinen, gut markierten, ziemlich dicht stehenden Punkten. Mentum breit, apikad verbreitert, mit etwas verrundeten, breiten, glänzenden und flachen Seitenrändern; median dazwischen matt, etwas gewölbt. Unterseite des Halses mit kleinen, dicht stehenden Punkten auf mikroretikuliertem Grund. Mandibeln außen gefurcht, apikal bifid.

Halsschild: Breit, aber nicht kurz. Quer deutlich gewölbt, längs etwas geringer gewölbt. Seiten verengen sich verrundet nach vorne. Vorderecken bei Blick von oben verrundet. Vorderrand etwas ausgeschnitten. Seitenränder und Vorderrand durchgehend gerandet. Randungen der Seiten von oben in der ganzen Länge – vorne aber nur schmal – sichtbar. Bei Ansicht von der Seite haben die Vorderecken, sehr schmal verrundet, einen Winkel von etwa 95°, die eckigen Hinterecken sind stumpfwinkliger. Oberseite deutlich, etwas unregelmäßig und ziemlich dicht punktiert, Punkte klein.

Scutellum: Dreieckig, mit einigen winzigen Punkten.

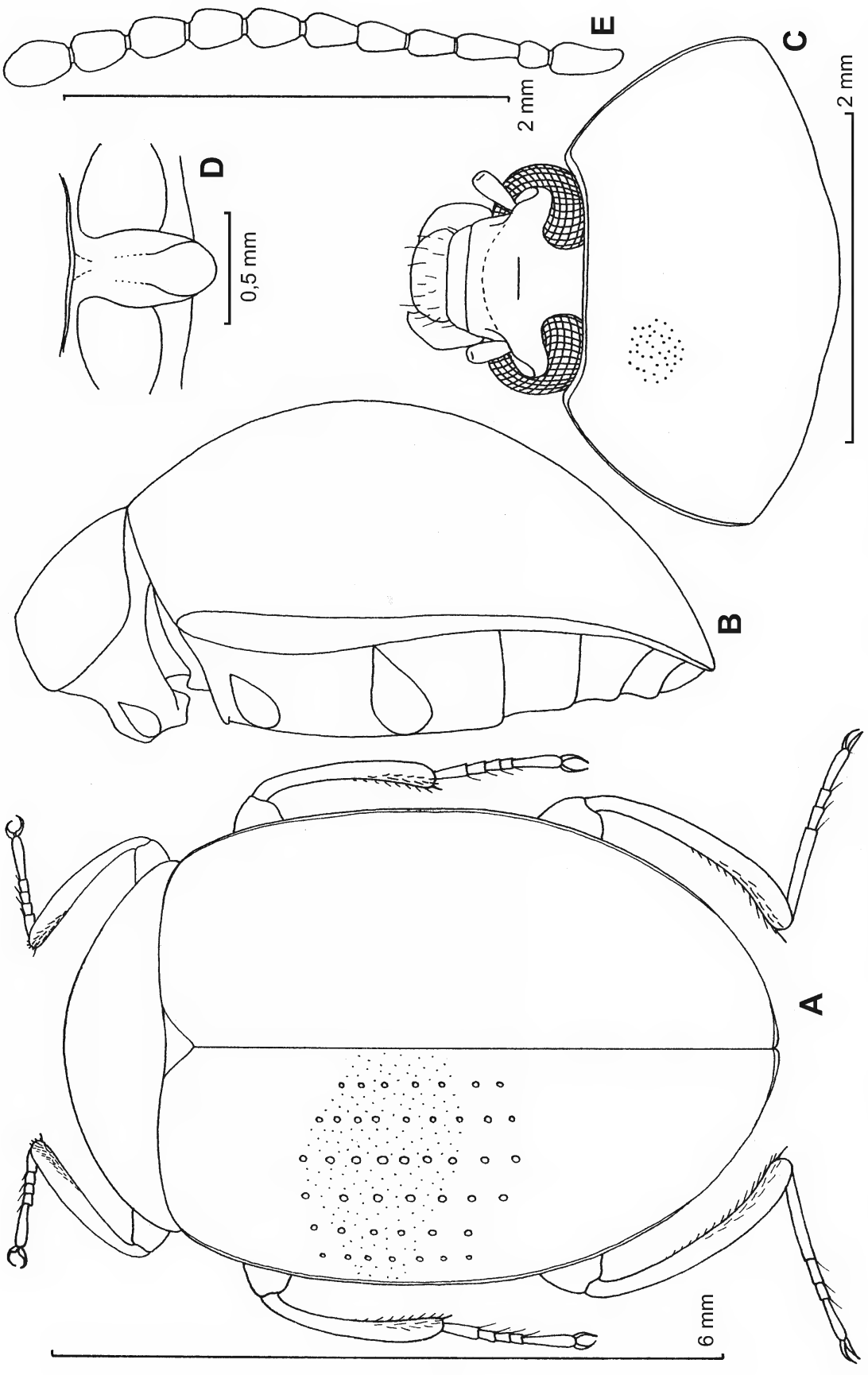


**Abb. 2.** *Amarygmus ambitiosus* n. sp. – **A** Habitus. **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Fühler.

Flügeldecken: Oval, etwas länglich, quer und längs stark gewölbt. Größte Höhe und Breite etwa in der Mitte. Schulterbeulen zu erkennen. Enden der Flügeldecken gemeinsam verrundet. Seitenrandkanten von oben in der gesamten Länge schmal sichtbar. Auf der Oberseite Punktreihen ziemlich großer und deutlich voneinander entfernt liegender Punkte; etwa 24 Punkte in der 4. Reihe. Interstitien flach; fein, aber ziemlich dicht und deutlich punktiert.

Prosternum: Vorderrand durchgehend schmal aufgebogen, nicht zur Apophyse hin eingezogen, aber median mit einem sehr kurzen Kiel in Richtung Apophyse. Apophyse länglich, kaudad hinter den Hüften horizontal vorgezogen, apikad verrundet; neben den Hüften Seitenränder leicht verbreitert und gering ventrad aufgebogen, median dort mit einer deutlichen, aber nicht sehr tiefen Furche.

Mesosternum: Hinterer Abschnitt vorne median ausgeschnitten; auf den Ecken des Ausschnitts je eine Tuberkel. Seitliche Ränder des hinteren Teils gegenüber der glatten Mitte etwas angehoben.

Metasternum: Vorderrand zwischen den Mesocoxae verrundet, breit gerandet. Vordere Abschnitte mit kleinen, flachen Punkten, hintere Abschnitte mit winzigen, schütter stehenden Punkten, die Ausgangspunkt für winzige Härchen sind. Medianlinie im mittleren Bereich angedeutet eingeschnitten.

Sternite: Vorderrand des 1. Sternits zwischen den Metacoxae spitzbogig, breit gerandet. Sternite fein und mäßiggradig dicht punktiert.

Fühler: Kurz, zurückgelegt etwa das erste Viertel der Flügeldecken überlappend. Antennomer 11 apikal verrundet. Die Längen und Breiten der Antennomeren 1–11 verhalten sich wie 11:7 / 7:5 / 13:5 / 10:6 / 10:7 / 11:7½ / 12:8 / 12:8 / 12:8 / 12:8 / 15:8.

Beine: Kurz. Femora zum zweiten Drittel hin keulenförmig verdickt. Protibiae annähernd gerade. Mesotibiae außen etwas gekrümmt, innen gerade. Metatibiae in der apikalen Hälfte etwas stärker als Mesotibiae gekrümmt. Die Längen der Protarsomeren 1–5 sind 7:6:5:5:18, die der Mesotarsomeren 1–5 sind 13:9:6:5:20, die der Metatarsomeren 1–4 sind 35:11:6:19.

## *Amarygmus antiquus* **n. sp.**
(Abb. 3A–I)

Holotypus (♂) [etikettiert auf vergilbtem Papier]: Philippinen, Leyte, St. Cruz (NMHUB).

Paratypus: Gleiche Funddaten wie Holotypus (1 ♀ NMHUB).

### Etymologie

Antiquus (lat.) = alt; da es wegen der altertümlichen Schreibweise auf den vergilbten Etiketten wahrscheinlich ist, dass die Tiere vor langer Zeit gesammelt wurden.

### Diagnose

Groß, länglich oval, farbig. Flügeldecken mit Punktreihen ziemlich großer, deutlich voneinander entfernt liegender, runder Punkte; Interstitien flach und ziemlich fein und schütter punktiert. Stirn schmal. Fühler lang und dünn. Protarsomeren 1–3 beim ♂ nicht verbreitert. Meso- und Metafemora beim ♂ mit langen Haaren.

Gehört in die Gruppe um *A. spectabilis* (Gebien, 1921) und steht dort besonders *A. abiectus* n. sp. nahe. *A. abiectus* besitzt ebenso wie *A. antiquus* Punktreihen auf den Flügeldecken, aber die Stirn ist wesentlich breiter, die Interstitien der Flügeldecken sind unpunktiert (bei *A. antiquus* fein und weitläufig punktiert) und die ♂♂ haben keine langen Haare an den Hinterseiten der Meso- und Metafemora (*A. antiquus* mit langen Haaren).

Wegen der Färbung der Oberseite erinnert *A. antiquus* an den etwas größeren *A. planipennis* (Kulzer, 1951), der von Sibuyan und Mindanao beschrieben wurde. *A. planipennis* besitzt im Gegensatz zu *A. antiquus* Punktreihen mit so dicht stehenden Punkten, dass diese wie eingedrückte Striae erscheinen, außerdem sind die Interstitien bei *A. planipennis* auf der Scheibe meist gewölbt und deutlich dichter als bei *A. antiquus* punktiert. Die ♂♂ von *A. planipennis* besitzen, ebenso wie die von *A. antiquus*, lange Haare an den Hinterseiten der Meso- und Metafemora.

### Beschreibung

Maße: Länge 9,55 + 11,14 mm. Breite 5,25 + 5,57 mm. – Relationen: Breite/Länge des Halsschildes 1,72 + 1,83; Breite Hinterecken/Breite Vorderecken des Halsschildes 1,70 + 1,74. Länge/Breite der Flügeldecken 1,49 + 1,51; Länge Flügeldecken/Länge Halsschild 3,59 + 3,89; maximale Breite Flügeldecken/maximale Breite Halsschild 1,40 + 1,41.

Farbe: Oberseite leicht glänzend. Halsschild bei einem Exemplar purpurn, in grün changierend, bei dem anderen leicht grün. Flügeldecken bei Aufsicht mit leichtem Farbspiel, bei schräger Aufsicht purpurn, mit grünlicher Komponente. Clypeus, Beine und Fühler schwarz. Unterseite schwarz. Metasternum glänzend, Sternite matt.

Kopf: Stirn bei beiden Geschlechtern sehr schmal, die Breite entspricht etwa der Länge des 2. Antennomers. Wangen sehr kurz, vorne vor der Höhe des mittleren Teils der Stirnnaht endend, gewölbt. Stirnnaht median etwas eingeschnitten, seitlich kaum zu erkennen. Clypeus vorgezogen, quer und längs leicht gewölbt. Clypeus dicht und klein punktiert, Punktierung der Stirn schütterer. Mentum umgekehrt trapezförmig, mit breiten, flachen, glänzenden Seitenrändern. Unterseite des Halses mit kleinen, schütter stehenden Punkten. Mandibeln außen gefurcht, apikal bifid.

Halsschild: Ziemlich schmal, quer deutlich, längs schwach gewölbt. Seiten verengen sich leicht verrundet

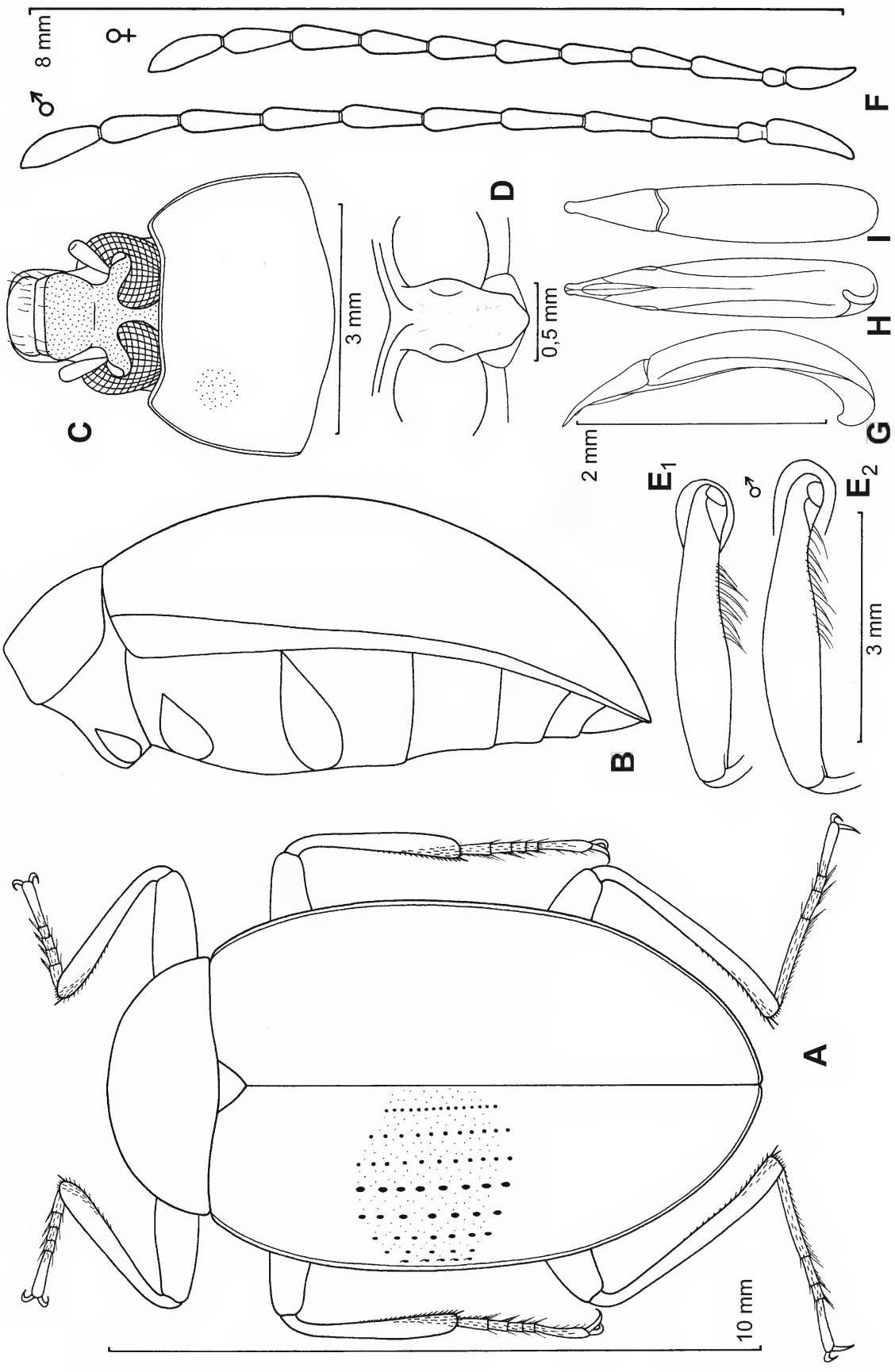


**Abb. 3.** *Amarygmus antiquus* n. sp. – **A** Habitus, ♂. **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E**$_1$ Mesofemur, ♂. **E**$_2$ Metafemur, ♂. **F** Fühler, ♂ und ♀. **G** Aedoeagus lateral. **H** Aedoeagus ventral. **I** Aedoeagus dorsal.

nach vorne. Vorderecken nicht vorstehend. Vorderrand leicht ausgeschnitten. Seiten und Vorderrand durchgehend gerandet. Bei Aufsicht sind die Randungen der Seiten in der ganzen Länge sehr schmal sichtbar. Bei Ansicht von der Seite sind die Vorderecken rechtwinklig, die Hinterecken stumpfwinklig. Oberseite mit feinen, nicht sehr dicht stehenden Punkten.

Scutellum: Dreieckig, mit einigen feinen Punkten.

Flügeldecken: Länglich oval, quer und längs für *Amarygmus*-Arten relativ wenig gewölbt. Größte Breite und Höhe kurz vor der Mitte. Schulterbeulen angedeutet. Enden der Flügeldecken gemeinsam verrundet. Seitenrandkanten von oben in der gesamten Länge schmal sichtbar. Auf der Oberseite Punktreihen ziemlich großer Punkte, die auf der Scheibe meist einen Abstand voneinander haben, der dem 1½- bis 2-fachen der Punktdurchmesser entspricht. Interstitien auf der Scheibe flach, hinten seitlich leicht gewölbt, mit feinen, weitläufig stehenden Punkten.

Prosternum: Vorderrand seitlich schmal aufgebogen, median mit einem breiten Kiel in Richtung Apophyse; dessen Fortsetzung durchzieht median als niedriger Kiel die Apophyse. Apophyse nicht sehr breit; neben den Hüften die Seiten etwas verbreitert und ventrad angehoben, dazwischen mit einer nicht sehr tiefen Furche; hinter den Hüften die Seiten subparallel; apikal breit zugespitzt; mit einigen ungerichtet stehenden, mittellangen Haaren.

Mesosternum: Vorderrand des hinteren Teils median tief ausgeschnitten; seitlich auf dem hinteren Teil mit je einer tiefen Furche.

Metasternum: Vorderrand zwischen den Mesocoxae verrundet, dick gerandet. Auf dem vorderen Teil der Scheibe mit einigen kleinen Punkten, dahinter nur mit winzigen Punkten. Mediane Sutur hinten schwach eingedrückt.

Sternite: Vorderrand des 1. Sternits zwischen den Metacoxae spitzbogig, schmal gerandet. Sternite 1 und 2 median mit ziemlich dicht stehenden, flachen, kleinen Punkten, Sternite 3–5 feiner punktiert. Analsternit apikomedian beim ♂ weder abgeschnitten noch eingedrückt.

Fühler: Lang, dünn, zurückgelegt beim ♂ etwas die Mitte der Flügeldecken überlappend, beim ♀ etwas kürzer. Die Längen und Breiten der Antennomeren 1–11 verhalten sich beim ♂ wie 16:6½ / 6:5 / 19:5½ / 15:6 / 18:6 / 19:6½ / 19:6½ / 19:6½ / 19:6½ / 18:6½ / 21:6½, beim ♀ wie 16:6½ / 5:5 / 18:5 / 14:5 / 16:5½ / 15:6 / 16:6 / 16:6½ / 16:6½ / 16:6½ / 19:6½.

Beine: Ziemlich lang. Femora zum zweiten Drittel hin etwas verdickt. Beim ♂ finden sich an den Rückseiten der Meso- und Metafemora im basalen Drittel lange, schräg abstehende, dünne Haare. Protibiae gerade, tendenziell außen konkav. Mesotibiae annähernd gerade. Metatibiae in den basalen zwei Drittel gerade, im apikalen Drittel sehr leicht einwärts gebogen. Protarsomeren beim ♂ nicht verbreitert. Die Längen der Protarsomeren 1–5 sind 9:8:8:6:23, die der Mesotarsomeren 1–5 sind 13:8:8:5½:25, die der Metatarsomeren 1–4 sind 31:22:8:23.

Aedoeagus: Siehe Abb. 3G-I.

## *Amarygmus bakeri* **n. sp.**
(Abb. 4A–H)

Holotypus (♂): Philippine Is., C. F. Baker, 1910-207, Mt. Makiling, Luzon, Baker (NHM).

Paratypen: Quezon, Philippines, 20.–21.V.1981, M. Tao leg. (1 ♂ CM). – Philippinen; [handschriftlich, unleserlich] …; [handschriftlich] Herzog (1 ♀ ZSM).

### Etymologie

Benannt nach Charles Fuller Baker, 1872–1927, dem Sammler des Holotypus, von dem sehr viel altes, philippinisches Material stammt, das sich heute in verschiedenen Sammlungen findet.

### Diagnose

Langgestrecke, ovale, mittelgroße Art mit sehr breiten und verlängerten Protarsomeren 1–3 bei den ♂♂. Flügeldecken mit Striae; Interstitien auf der Scheibe eben, seitlich etwas gewölbt. Halsschild relativ schmal. Fühler lang. Oberseite rotbraun bis metallisch, mit farbigen Reflexionen. Beine und Fühler braun bis dunkelbraun. Auffällige Form des Aedoeagus (Abb. 4F–H).

Ähnelt sehr dem *A. angustus* Gebien, 1913, aber der Halsschild ist bei *A. bakeri* schmaler als bei *A. angustus* und quer stärker gewölbt, die Stirn ist etwas schmaler, die Beine sind braun bis dunkelbraun (bei *A. angustus* schwarz). Der kleine Buckel auf der Dorsalseite des Aedoeagus fehlt bei *A. angustus* (Abb. 30G–I).

### Beschreibung

Maße: Länge 7,25–7,88 mm. Breite 3,62–3,86 mm. – Relationen: Breite/Länge des Halsschildes 1,72–1,79; Breite Hinterecken/Breite Vorderecken des Halsschildes 1,68–1,74. Länge/Breite der Flügeldecken 1,67–1,73; Länge Flügeldecken/Länge Halsschild 3,62–3,90; maximale Breite Flügeldecken/maximale Breite Halsschild 1,21–1,28.

Farbe: Oberseite je nach Reifegrad rotbraun bis grün, metallisch glänzend, mit queren Reflexionen in den Spektralfarben auf Flügeldecken und Halsschild. Fühler und Tibiae braun bis dunkelbraun, Tarsen braun. Unterseite und Femora schwarzbraun, leicht matt.

Kopf: Stirn mittelbreit, etwas breiter als die Länge des 3. Antennomers (wie 21:20). Wangen an den Seiten des Kopfes gelegen, nach vorne den mittleren Bereich der Stirnnaht überlappend, gering gewölbt. Stirnnaht nur median leicht eingedrückt. Clypeus gegenüber dem Vorderrand der Wangen wenig, gegenüber der Stirnnaht mittelweit vorgezogen; flach, nur vorne seitlich etwas herabge-

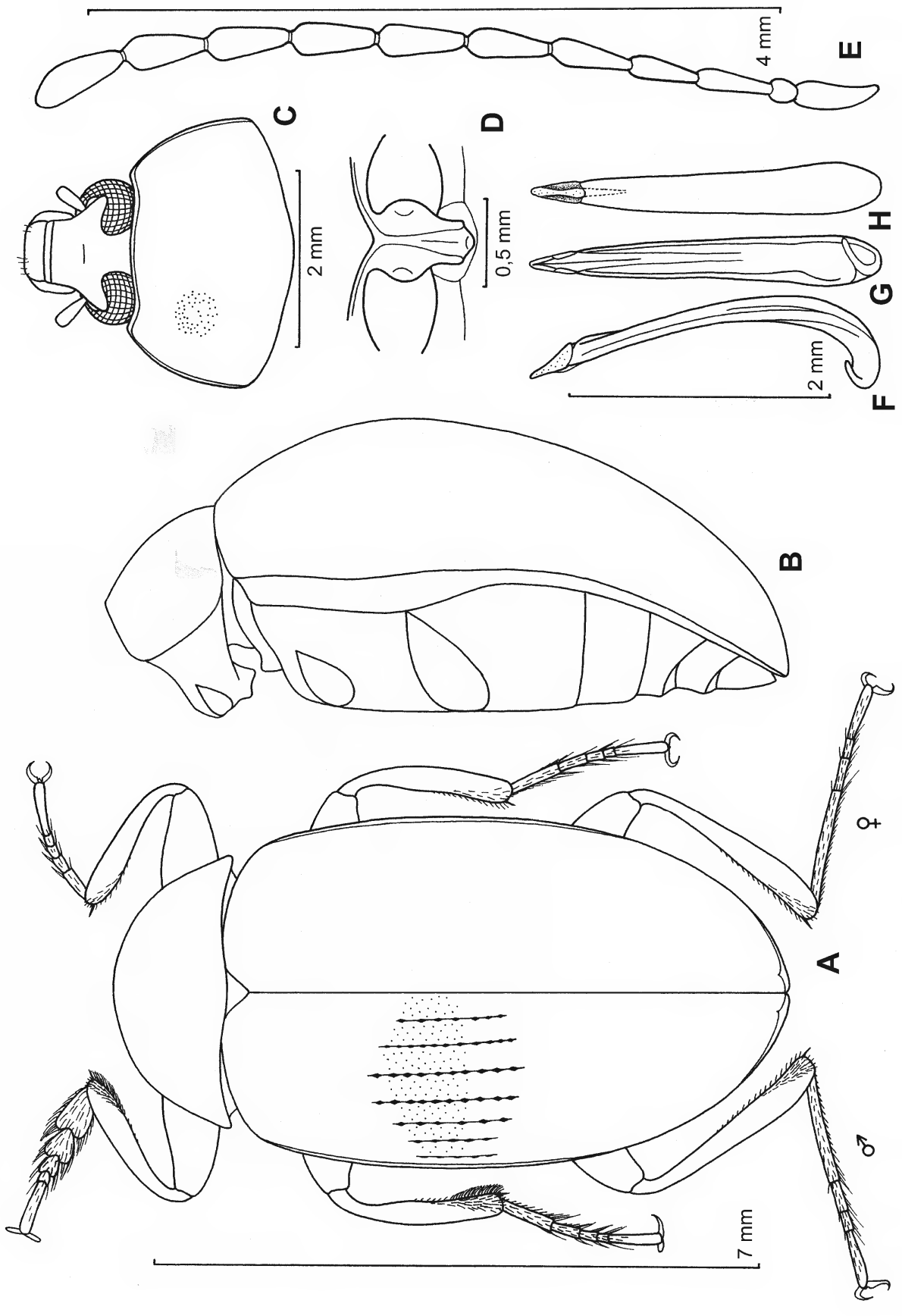


**Abb. 4.** *Amarygmus bakeri* n. sp. – **A** Habitus; linksseitig Beine ♂, rechtsseitig Beine ♀. **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Fühler. **F** Aedoeagus lateral. **G** Aedoeagus ventral. **H** Aedoeagus dorsal.

bogen. Clypeus und Stirn mit feinen, nicht sehr dicht stehenden Punkten. Mentum umgekehrt trapezförmig. Unterseite des Halses mikroretikuliert, mit kleinen, flachen, nicht sehr dicht stehenden Punkten. Mandibeln außen gefurcht, apikal bifid.

Halsschild: Ziemlich schmal, quer stark und gleichmäßig gewölbt, längs leicht gewölbt. Seiten verengen sich nach vorne, in der hinteren Hälfte mit geraden Seiten, in der vorderen Hälfte etwas verrundet. Vorderecken bei Blick von oben nicht sichtbar. Seitenränder und Vorderrand durchgehend gerandet. Bei Aufsicht sind die Randungen der Seiten nur in der hinteren Hälfte schmal sichtbar. Bei Ansicht von der Seite sind die Vorderecken verrundet und stumpfwinklig, die Hinterecken eckig und stumpfwinklig. Oberseite mit kleinen, ziemlich dicht stehenden Punkten.

Scutellum: Dreieckig, mit leicht verrundeten Seiten und einigen winzigen Punkten.

Flügeldecken: Länglich oval, quer stark gewölbt, längs deutlich gewölbt. Größte Höhe und Breite kurz vor der Mitte. Schulterbeulen angedeutet. Enden der Flügeldecken gemeinsam verrundet. Seitenrandkanten bei Blick von oben nicht sichtbar. Auf der Oberseite etwas, seitlich deutlich eingeschnittene Striae mit mittelgroßen, runden und länglichen Punkten, die in der 4. Stria Abstände voneinander haben, die dem 1- bis 2-fachen ihrer Durchmesser entsprechen; in der 4. Stria etwa 30 Punkte. Interstitien auf der Scheibe leicht gewölbt, seitlich deutlich gewölbt, mit feinen, nicht sehr dicht stehenden Punkten.

Prosternum: Vorderrand schmal aufgebogen, median deutlich zur Apophyse hin eingezogen, so dass dort ein scharfer Winkel entsteht. Apophyse ziemlich schmal; neben den Hüften sind die Ränder stark verbreitert und ventrad angehoben; median dort mit einer tiefen, schmalen Furche; hinter den Hüften sind die subparallelen Seiten kaudad vorgezogen; apikal verrundet, median ist dort der Rand etwas angehoben.

Mesosternum: Hinterer Teil ziemlich schmal, vorne median deutlich ausgeschnitten; nach hinten sind die subparallelen Seiten etwas angehoben.

Metasternum: Vorderrand zwischen den Mesocoxae schmal verrundet, gerandet, innerer Rand sowie die vorderen Querfalten hinter den Mesocoxae punktiert. Im Apophysenbereich mit wenigen kleinen Punkten, dahinter mit winzigen, weitläufig stehenden Pünktchen. Medianlinie fast in der gesamten Länge etwas eingeschnitten.

Sternite: Vordere Ränder zwischen den Metacoxae laufen gerade aufeinander zu, vorne treffen sie sich in einem spitzen Winkel; innere Randung sowie die anschließenden lateralen Querfurchen hinter den Metacoxae punktiert. Sternite mit winzigen, weitläufig stehenden, an der Grenze der Sichtbarkeit liegenden Pünktchen. Bei den ♂♂ ist die Intersegmentalmembran zwischen den Sterniten 3 und 4 sowie 4 und 5 stark verbreitert, so dass median die Sternite 3 und 4 verkürzt sind. Analsternit der ♂♂ apikomedian eingedrückt und medianer Rand ausgeschnitten; diese Depression ist umgeben von einem Kranz langer, anliegender, nach hinten gerichteter Haare; auch beim ♀ finden sich dort einzelne lange Haare, obwohl bei ihm die apikomediane Depression fehlt.

Fühler: Lang, dünn. Antennomer 11 apikal verrundet. Die Längen und Breiten der Antennomeren 1–11 verhalten sich wie 16:9 / 9:7 / 20:8 / 18:7½ / 22:8½ / 22:9 / 25:9½ / 25:10 / 24:10 / 23:10 / 28:11.

Beine: Kurz. Femora zum zweiten Drittel hin stark keulenförmig verdickt. Protibiae apikad verdickt, annähernd gerade. Mesotibiae leicht gekrümmt. Bei den ♂♂ apikal an der Innenseite der Mesotibiae ein Feld mittellanger, dicht stehender Haare. Metatibiae leicht gekrümmt. Protarsomeren 1–3 der ♂♂ verlängert und verbreitert in abnehmender Größe. Die Längen der Protarsomeren 1–5 bei den ♂♂ sind 19:15:10:6:33, die der Mesotarsomeren 1–5 sind 24:13:11:8:33, die der Metatarsomeren 1–4 sind 55:19:10:33.

Aedoeagus (Abb. 4F–H): Auf der Dorsalseite ist der Mittelbereich des Vorderteils leistenartig – nach hinten zunehmend – angehoben, endend in einer kleinen, glänzenden Anhebung.

## *Amarygmus boetticheri* **n. sp.**
(Abb. 5A–I)

Holotypus (♂): Philippines, Mindanao, 30 km W of Maramag, 1600 m, 28.–30.XII.1990, Bolm leg. (NHMB).

Paratypen: Philippinen (Boetticher), Imugan, Luzon (1 ♂ ZSMB). – Surigao, Mindanao, Philippinen, Boetticher (1 ♀ NHMBF). – Logging road near Rawis, Samar Is., Philippines, 2.–3.VI.1983, Minoru Tao leg. (1 ♀ CM).

### Etymologie

Boetticheri, nach dem Sammler Georg Boetticher, 1890–1919, von dem umfangreiches Coleopteren-Material aus den Philippinen in die Sammlungen des NMHUB und NHMBF gelangte.

### Diagnose

Klein, länglich oval, quer sehr stark gewölbt; mit glänzender grüner Oberseite, die aber bei schrägem Lichteinfalls in verschiedenen Farben reflektiert. Stirn nicht sehr breit. Fühler mittellang. Protarsomeren 1–3 leicht verbreitert. Besonders auffallend ist der Aedoeagus, der an der Spitze dorsal einen Widerhaken besitzt (Abb. 5G–I).

Eine ähnliche Körperform und einen Aedoeagus mit einem Widerhaken auf der dorsalen Seite der Spitze besitzen *A. fulgurans* Gebien, 1927 aus Java und Sumatra, *A. tenellus* Bremer, 2003 aus Borneo, sowie drei unbeschriebene Arten aus Borneo. Bei diesen Arten sind jedoch die Striae bzw. Punkte der Flügeldecken anders geformt als

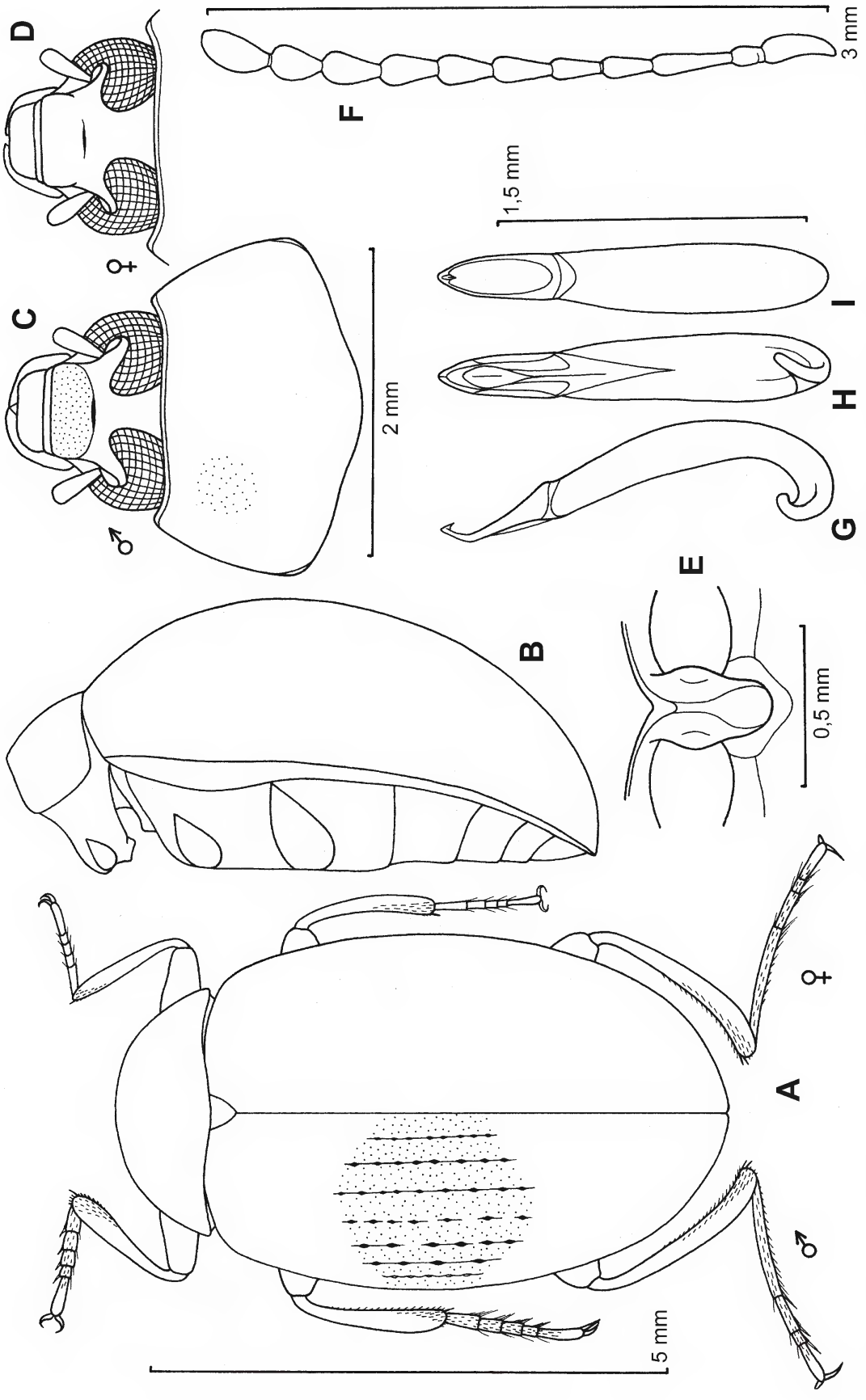


**Abb. 5.** *Amarygmus boetticheri* n. sp. – **A** Habitus; linksseitig Beine ♂, rechtsseitig Beine ♀. **B** Körper lateral. **C** Kopf und Halsschild, ♂. **D** Kopf, ♀. **E** Prosternalapophyse. **F** Fühler. **G** Aedoeagus lateral. **H** Aedoeagus ventral. **I** Aedoeagus dorsal.

bei *A. boetticheri*, und der Spitzenteil des Aedoeagus ist nicht so stark dorsal flektiert.

Von den philippinischen Arten ähnelt *A. boetticheri* etwas dem *A. mindanaensis* n. sp. in Größe, Körperform, Punktierung und Sexualdimorphismus, aber die Punkte der Punktreihen sind bei *A. boetticheri* mit feinen Strichen miteinander verbunden (bei *A. mindanaensis* unverbunden), die Stirn ist schmaler, die Fühler sind kürzer, die Tarsen schwarz (bei *A. mindanaensis* braun), und der Aedoeagus hat eine andere Form.

### Beschreibung

Maße: Länge 5,02–5,73 mm. Breite 2,84–3,19 mm. – Relationen: Breite/Länge des Halsschildes 1,90–2,02; Breite Hinterecken/Breite Vorderecken des Halsschildes 1,63–1,68. Länge/Breite der Flügeldecken 1,45–1,53; Länge Flügeldecken/Länge Halsschild 3,95–4,15; maximale Breite Flügeldecken/maximale Breite Halsschild 1,34–1,44.

Farbe: Oberseite leicht glänzend. Grundfarbe grün, je nach Winkel des Lichteinfalls in den verschiedenen Spektralfarben reflektierend, Schultern bei Ansicht von vorne blaugrün. Beine und Fühler schwarz. Unterseite schwarz.

Kopf: Stirn mittelbreit, etwas schmaler als die Länge des 4. Antennomers (wie 10:12). Wangen kurz und schmal, vor der Höhe des mittleren Teils der Stirnnaht endend, gering gewölbt. Stirnnaht median schwach eingeschnitten, nicht eingedrückt. Wangen vorgezogen, quer gering gewölbt. Clypeus mit feinen, weitläufig stehenden Punkten. Stirn kaum punktiert. Mentum umgekehrt trapezförmig, mit breiten, glänzenden Seiten; median dazwischen matt, gewölbt. Mandibeln außen gefurcht, apikal bifid.

Halsschild: Trapezoid. Quer stark gewölbt; längs gering gewölbt. Vorderecken nicht vorgezogen, Vorderrand gerade. Seiten und Vorderrand durchgehend gerandet. Bei Aufsicht sind die Randungen der Seiten in der hinteren Hälfte sichtbar. Bei Ansicht von der Seite sind die Vorderecken rechtwinklig, die Hinterecken schwach stumpfwinklig. Oberseite mit feinen, weitläufig stehenden Punkten.

Scutellum: Dreieckig, unpunktiert.

Flügeldecken: Länglich oval, quer stark gewölbt, längs deutlich gewölbt. Größte Breite und Höhe etwa in der Mitte. Schulterbeulen vorhanden. Enden der Flügeldecken gemeinsam verrundet. Seitenrandkanten von oben hinter den Schultern sehr schmal sichtbar. Auf der Oberseite Punktreihen mittelgroßer Punkte, die durch zarte Striche miteinander verbunden sind; auf der Scheibe in der 4. Reihe stehen die Punkte unregelmäßig, Abstände der Punkte voneinander entsprechen dem ½- bis 3-fachen der Punktdurchmesser; in der 4. Reihe etwa 28 Punkte. Interstitien auf der Scheibe flach, seitlich sehr leicht gewölbt, mit feinen, weitläufig stehenden Pünktchen.

Prosternum: Vorderrand seitlich schmal aufgebogen, median zur Apophyse hin eingezogen und dort einen kurzen Kiel in die Apophyse hinein sendend. Apophyse nicht sehr breit; neben den Hüften sind die Seiten etwas verbreitert und sehr deutlich ventrad angehoben, dazwischen median eine schmale, tiefe Furche; hinter den Hüften etwas kaudad vorgezogen, mit subparallelen, schmal angehobenen Seiten; apikal breit verrundet.

Mesosternum: Vorderrand des hinteren Teils median ausgeschnitten; Seiten des hinteren Teils schmal angehoben, dadurch liegt der mittlere Teil etwas tiefer.

Metasternum: Vorderrand zwischen den Mesocoxae verrundet, schmal gerandet. Vorne mit winzigen, weitläufig stehenden Pünktchen und (bei den ♂♂) zarten, sehr kurzen Härchen. Mediane Sutur in der ganzen Länge eingeschnitten, hinten auch breit eingedrückt.

Sternite: Vorderrand des 1. Sternits zwischen den Metacoxae spitzbogig, gerandet. Auf den Scheiben der Sternite weitläufig stehende, winzige Pünktchen und (bei den ♂♂) winzige Härchen, ähnlich wie auf dem Metasternum, seitlich mit längsstrichigen Strukturen. Analsternit apikomedian (bei den ♂♂) mit einem deutlichen Eindruck, vor dem sich mehrere lange, nach hinten gerichtete Haare befinden.

Fühler: Mittellang, zurückgelegt nicht ganz die Mitte der Flügeldecken erreichend. Die Längen und Breiten der Antennomeren 1–11 verhalten sich wie 14:6 / 6:4½ / 17:4½ / 12:4½ / 12:5 / 13:6½ / 12:7 / 13:7 / 13:8 / 12:8 / 16:8½.

Beine: Kurz. Femora zum zweiten Drittel hin keulenförmig verdickt. Protibiae gerade. Mesotibiae apikal leicht an der Innenseite verdickt, sehr leicht gekrümmt. Metatibiae in der basalen Hälfte annähernd gerade, in der apikalen Hälfte zunehmend einwärts gekrümmt. Protarsomeren 1–3 beim ♂ leicht verlängert und verbreitert. Die Längen der Protarsomeren 1–5 sind 10:9:8:4:19, die der Mesotarsomeren 1–5 sind 15:11:9:5:21, die der Metatarsomeren 1–4 sind 43:13:8:21.

Aedoeagus: Siehe Abb. 5G-I.

## *Amarygmus dembickyi* **n. sp.**
(Abb. 6A–H)

Holotypus (♂): Philippines, N Luzon, Kalinga-AP/ Abra Pr. boundary, Cordillera Centr., around Pass at 1600 ± 100 m, 17°30'N 121°00'E, 26.–28.III.2000, L. Dembický leg. (SMNS).

Paratypen: Gleiche Funddaten wie Holotypus (1 ♀ SMNS). – Philippines, N Luzon, Mountain Prov., Bontoc region, NW of Barlig, 2000 m, 17°03'N 121°04'E, 9.IV.2000, L. Dembický leg. (1 ♂, 1 ♀ ZSMB, 1 ♀ SMNS). – Philippines, Baguio, Benguet Prov., Luzon, 25.V.1977, M. Sato leg. (1 ♀ CM, 1 ♀ ZSMB). – Philippines, Mt. Santo Tomas, 2250 m, Benguet Prov., Luzon, 12.VI.1977, M. Sato leg. (1 ♀ CA) (Exemplare teilweise immatur).

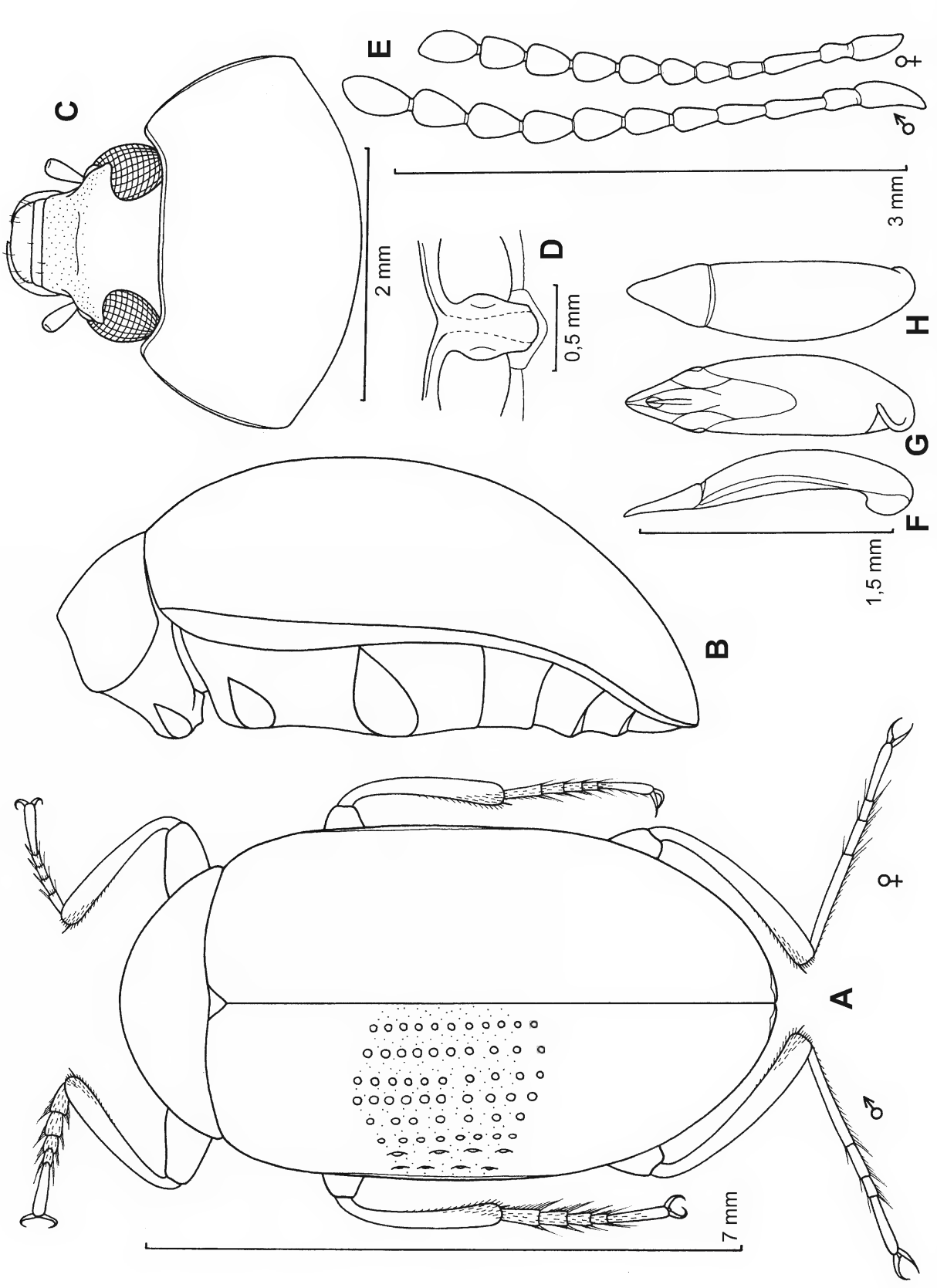


**Abb. 6.** *Amarygmus dembickyi* n. sp. – **A** Habitus; linksseitig Beine ♂, rechtsseitig Beine ♀. **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Fühler, ♂ und ♀. **F** Aedoeagus lateral. **G** Aedoeagus ventral. **H** Aedoeagus dorsal.

Etymologie

Dembickyi, nach dem Sammler und Cerambyciden-Spezialisten LUBOŠ DEMBICKÝ (Brno).

Diagnose

Mittelgroß, länglich. Subparallele Flügeldecken mit Punktreihen mittelgroßer Punkte, die ziemlich weit voneinander entfernt liegen; Interstitien flach, kaum punktiert. Halsschild nicht sehr breit. Stirn ziemlich breit. Fühler relativ kurz. Halsschild matt. Flügeldecken leicht glänzend, blaugrün. Beine dunkelbraun. Protarsomeren 1–3 der ♂♂ deutlich verbreitert. Metasternum der ♂♂ kahl.

Die neue Art steht *A. latipes* (Kulzer, 1951) und *A. inversus* Bremer, 2005 nahe.

*A. latipes* besitzt etwa dieselbe Größe und Punktierung der Flügeldecken, hat aber längere Fühler als *A. dembickyi* (sie erreichen die Mitte der Flügeldecken), die Protarsomeren 1–3 der ♂♂ sind breiter, der Augenabstand auf der Stirn ist enger und die Spitze des Aedoeagus ist dorsad gebogen (bei *A. dembickyi* gerade).

*A. inversus* ist etwas größer als *A. dembickyi*, die Fühler sind länger, die Protarsomeren 1–3 der ♂♂ sind breiter und die Beine bei maturen Exemplaren heller braun. Die Stirn ist bei *A. inversus* ähnlich breit wie bei *A. dembickyi*, die Form und Färbung des Körpers sowie die Form des Aedoeagus sind bei beiden Arten ähnlich.

Beschreibung

Maße: Länge 7,40–8,12 mm. Breite 3,82–4,46 mm. – Relationen: Breite/Länge des Halsschildes 1,79–2,00; Breite Hinterecken/Breite Vorderecken des Halsschildes 1,71–1,77. Länge/Breite der Flügeldecken 1,54–1,71; Länge Flügeldecken/Länge Halsschild 4,14–4,32; maximale Breite Flügeldecken/maximale Breite Halsschild 1,26–1,31.

Farbe (bei maturen Exemplaren): Stirn und Halsschild schwarz, matt. Flügeldecken blaugrün, leicht glänzend. Unterseite dunkelbraun (Sternite dunkler als Metasternum). Beine braun (Femora etwas heller als die Unterseite). Fühler braun.

Kopf: Stirn breit (etwa so breit wie die doppelte Länge des 3. Antennomers). Wangen kraniad etwa bis zum medianen Bereich der Stirnnaht reichend, gering gewölbt. Stirnnaht median etwas eingedrückt, kaum eingeschnitten. Clypeus mittelweit vorgezogen, längs und quer sehr leicht gewölbt. Clypeus und Stirn mit schütter stehenden, winzigen Punkten. Mentum umgekehrt trapezförmig, mit gewölbter Mitte. Unterseite des Halses mit kleinen, nicht sehr dicht stehenden Punkten. Mandibeln außen gefurcht, apikal bifid.

Halsschild: Kurz. Quer gleichmäßig gewölbt, längs gering gewölbt. Seiten verengen sich verrundet nach vorne. Vorderecken stehen schmal verrundet etwas vor. Vorderrand etwas ausgeschnitten. Seiten und Vorderrand durchgehend gerandet. Randungen der Seiten von oben nur sehr schmal sichtbar. Bei Ansicht von der Seite sind Vorder- und Hinterecken leicht stumpfwinklig. Oberseite mit winzigen, nicht sehr dicht stehenden Punkten.

Scutellum: Dreieckig, unpunktiert.

Flügeldecken: Länglich, mit subparallelen Seiten, quer sehr deutlich gewölbt. Größte Höhe etwas vor der Mitte. Schultern sichtbar. Enden der Flügeldecken gemeinsam verrundet. Seitenrandkanten von oben nur vorne an der Schultern sichtbar. Auf der Oberseite Punktreihen ziemlich großer Punkte, die in einigem Abstand voneinander liegen; Punkte auch im Absturz entwickelt, dort aber ohne Reihung; in der 4. Reihe etwa 17 Punkte; die Abstände der Punkte voneinander in der 4. Reihe auf der Scheibe entsprechen dem 2- bis 3-fachen der Punktdurchmesser. Interstitien annähernd flach, mit weitläufig stehenden, winzigen Pünktchen.

Prosternum: Vorderrand seitlich schmal aufgebogen, median deutlich zur Apophyse hin eingezogen und einen Kiel kurz in die Apophyse hinein sendend. Apophyse ziemlich schmal, neben den Hüften die Seiten verbreitert und deutlich ventrad angehoben, dort findet sich median eine tiefe Furche; hinter den Hüften verengen sich die geraden Seiten etwas und sind gegenüber dem mittleren Bereich herabgedrückt, apikal verrundet; der mittlere Bereich hinter den Hüften ist etwas angehoben und mikroretikuliert.

Mesosternum: Vorderrand des hinteren Teils median ausgeschnittten; seitlich des Ausschnitts mit je einer aufragenden Tuberkel. Die Seiten des hinteren Teils verengen sich etwas kaudad.

Metasternum: Scheibe mit feinen, weitläufig neben der medianen Sutur gelegenen Punkten. Mediane Sutur hinten etwas eingedrückt.

Sternite: Vorderrand des 1. Sternits zwischen den Metacoxae dreieckig, Seiten etwas gerandet. Sternite unpunktiert und leicht mikroretikuliert. Analsternit apikomedian bei den ♂♂ sehr leicht eingedrückt.

Fühler: Relativ kurz, zurückgelegt etwa ein Drittel der Flügeldecken überlappend. Die Längen und Breiten der Antennomeren 1–11 verhalten sich wie 15:8 / 10:6 / 17:5½ / 12:6 / 14:6½ / 13:8 / 13:9 / 16:10 / 16:10 / 16:10 / 20:10½.

Beine: Kurz. Femora zum zweiten Drittel hin keulenförmig verdickt. Protibiae apikad etwas verdickt, annähernd gerade. Mesotibiae, apikad etwas verdickt, sehr leicht gekrümmt. Metatibiae apikad verdickt, gekrümmt. Pro- und Mesotarsomeren 1–3 bei den ♂♂ verbreitert, aber nicht so stark wie bei einigen verwandten Arten (z. B. *A. inversus*). Die Längen der Protarsomeren 1–5 bei einem ♂ sind 13:12:9:8:32, die der Mesotarsomeren 1–5 sind 21:17:12:10:34, die der Metatarsomeren 1–4 sind 53:19:11:34.

Aedoeagus: Siehe Abb. 6F-H.

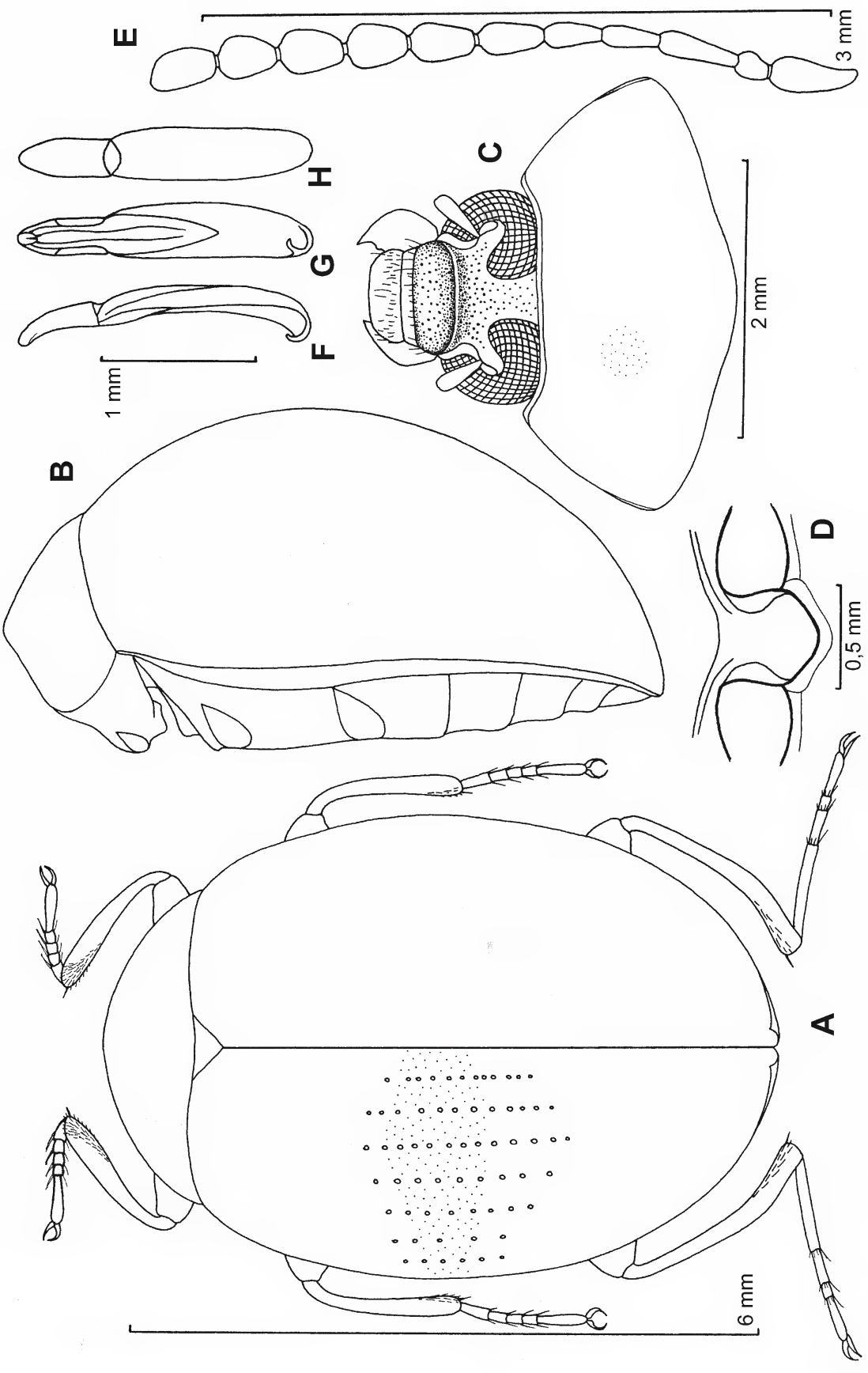


**Abb. 7.** *Amarygmus dissimilis* n. sp. – **A** Habitus, ♂. **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Fühler. **F** Aedoeagus lateral. **G** Aedoeagus ventral. **H** Aedoeagus dorsal.

### *Amarygmus dissimilis* **n. sp.**
(Abb. 7A–H)

Holotypus (♂): Mindanao, 30 km NW of Maramag, Bagongsilang, 1700 m, 13.–17.V.1996, Bolm leg. (SMNS).

Paratypen: Gleiche Funddaten wie Holotypus (2 ♂♂, 2 ♀♀ SMNS, 2 ♂♂ ZSMB).

#### Etymologie

Dissimilis (lat.) = unähnlich.

#### Diagnose

Geflügelt. Klein, stark gewölbt, kurz. Fällt auf durch farbige Flügeldecken mit Punktreihen kleiner Punkte, flache Interstitien, breiten Halsschild, nicht sehr breite Stirn und sehr tief eingeschnittene Stirnnaht. Protarsomeren bei den ♂♂ nicht verbreitert.

Sehr ähnlich sind *A. splendidulus* (Fabricius, 1801), der in der orientalischen Region weit verbreitet ist, und *A. diversetinctus* Pic, 1925 aus Java.

Die Körperform von *A. splendidulus* ist ähnlich der von *A. dissimilis*. Die Punkte der Punktreihen von *A. splendidulus* sind etwas größer als die von *A. dissimilis*, der Glanz ist bei *A. splendidulus* etwas stärker, die Stirnnaht ist geringer eingeschnitten, der Clypeus längs geringer gewölbt, die Stirn etwas schmaler und die Metatibiae sind stärker gekrümmt.

*A. diversetinctus* besitzt eine ähnlich stark eingeschnittene Stirnnaht wie *A. dissimilis* und die Punkte der Punktreihen der Flügeldecken sind bei beiden Arten ähnlich groß. Die Flügeldecken sind bei *A. diversetinctus* schmaler als bei *A. dissimilis*, die Seiten des Halsschildes verrundeter (fast gerade nach vorne verengend bei *A. dissimilis*) und die Metatibiae stärker gekrümmt.

Auf den Philippinen hat eine ähnliche Körperform mit Punktreihen kleiner Punkte auf den Flügeldecken der etwas kleinere *A. schultzei* n. sp. aus der Zentral-Cordillere von Luzon. Diese Art besitzt aber im Gegensatz zu *A. dissimilis* eine dunkelbraune, nicht glänzende Oberseite, einen Farbkontrast zwischen der dunklen Oberseite und den gelbbraunen Tibiae und Fühlern, sowie einen schmaleren Halsschild.

#### Beschreibung

Maße: Länge 5,65–6,37 mm. Breite 3,82–4,33 mm. – Relationen: Breite/Länge des Halsschildes 2,14–2,20; Breite Hinterecken/Breite Vorderecken des Halsschildes 1,72–1,79. Länge/Breite der Flügeldecken 1,22–1,30; Länge Flügeldecken/Länge Halsschild 3,94–4,17; maximale Breite Flügeldecken/maximale Breite Halsschild 1,38–1,44.

Farbe: Halsschild und Stirn blaugrün, glänzend. Flügeldecken je nach Winkel des Lichteinfalls in verschiedenen Farben, mäßiggradig glänzend. Unterseite dunkelbraun, leicht glänzend. Femora und Tibiae schwarz, Tarsen braun. Fühler schwarz.

Kopf: Stirn nicht sehr breit, die Breite entspricht etwa der Länge des 5. Antennomers. Wangen sehr gering entwickelt, sehr kurz, die Fühlerwurzel weitgehend freilassend, sehr wenig gewölbt. Stirnnaht durchgehend, sehr tief, furchenartig eingeschnitten. Clypeus nicht sehr weit vorgezogen, längs deutlich gewölbt, quer weniger gewölbt. Clypeus mit kleinen, unregelmäßig stehenden Punkten. Stirn mit feinen, nicht sehr dicht stehenden Punkten. Mentum breit, mit breiten, glänzenden, leicht gebogenen Seiten; dazwischen matt, leicht gewölbt. Unterseite des Halses mit großen, quer ausgerichteten, dicht stehenden Punkten. Mandibeln außen gefurcht, apikal bifid.

Halsschild: Breit, kurz, quer gewölbt, längs leicht gewölbt. Seiten verengen sich nach vorne; in den hinteren drei Fünftel mit annähernd geraden Seiten, davor etwas verrundet. Vorderrand annähernd gerade. Seitenränder und Vorderrand durchgehend gerandet. Die Randungen der Seiten sind von oben nur in der hinteren Hälfte sehr schmal sichtbar. Bei Ansicht von der Seite sind die Vorder- und Hinterecken annähernd gleich stark stumpfwinklig. Oberseite mit feinen, nicht sehr dicht stehenden Punkten.

Scutellum: Dreieckig, mit leicht verrundeten Seiten, kaum punktiert.

Flügeldecken: Ziemlich breit und kurz, oval, quer und längs sehr stark gewölbt. Größte Breite und Höhe etwa in der Mitte. Schultern deutlich. Enden der Flügeldecken gemeinsam verrundet. Seitenrandkanten von oben nicht sichtbar. Auf der Oberseite Punktreihen ziemlich kleiner Punkte, die in den ersten drei Reihen etwas enger als in den folgenden Reihen stehen; in der 4. Reihe entsprechen die Abstände der Punkte voneinander auf der Scheibe etwa dem 3-fachen der Punktdurchmesser; etwa 28 Punkte in der 4. Reihe. Interstitien flach, mit feinen, nicht sehr dicht stehenden Punkten.

Prosternum: Vorderrand seitlich schmal aufgebogen, median vor der Prosternalapophyse weder aufgebogen noch gerandet. Apophyse ziemlich kurz; neben den Hüften Seiten kaum verbreitert, dort Ränder nur unwesentlich ventrad angehoben, median mit einer breiten, glatten, nicht eingedrückten Fläche; apikal breit verrundet; mit einzelnen, zarten, ziemlich kurzen Haaren.

Mesosternum: Hinterer Teil breit, kurz; Vorderrand median breit verrundet ausgeschnitten. Mit einzelnen zarten, kurzen Haaren.

Metasternum: Vorderrand zwischen den Mesocoxae breit verrundet, gerandet. Scheibe gewölbt. Vordere Abschnitte mit kleinen, ziemlich dicht stehenden Punkten, mittlere und hintere Abschnitte mit feinen, weitläufig stehenden Punkten. Medianlinie sehr schmal eingeschnitten.

Sternite: Vorderrand des 1. Sternits zwischen den Metacoxae breitbogig, schmal gerandet. Insgesamt nur

sehr fein und weitläufig punktiert, aber deutlich geriefelt. Analsternit apikomedian bei den ♂♂ angedeutet eingedrückt.

F ü h l e r : Ziemlich kurz, bei beiden Geschlechtern etwa gleich lang, zurückgelegt etwa mit zwei Antennomeren die Basis der Flügeldecken überlappend. Antennomer 11 apikal asymmetrisch verrundet. Die Längen und Breiten der Antennomeren 1–11 verhalten sich wie 19:7 / 7:6 / 21:6 / 12:6 / 13:6½ / 16:8 / 15:9½ / 15:10 / 15:10 / 14:10 / 17:10.

B e i n e : Kurz. Tibiae ziemlich dünn. Femora zur Mitte hin keulenförmig aufgetrieben. Protibiae entweder annähernd gerade oder außen sehr leicht gebogen (innen gerade). Mesotibiae innen gerade, außen leicht gekrümmt. Metatibiae gekrümmt. Protarsomeren bei den ♂♂ nicht verbreitert, ihre Sohlenfläche dichter behaart als bei den ♀♀. Die Längen der Protarsomeren 1–5 sind 6:5:5:5:22, die der Mesotarsomeren 1–5 sind 14:9:7:6:24, die der Metatarsomeren 1–4 sind 39:16:7:22.

A e d o e a g u s : Siehe Abb. 7F-H.

## *Amarygmus eremitis* **n. sp.**
(Abb. 8A–H)

H o l o t y p u s (♂): Mt. Caula-on [= Mt. Canlaon], Negros, Philippines, II.2006, D. Mohagan leg. (FAEU).

### Etymologie

Eremitis (lat.) = einsiedlerisch.

### Diagnose

Mittelgroß, länglich oval. Beine kurz. Protarsomeren 1–3 in abnehmender Tendenz stark verbreitert. Fühler ziemlich kurz. Auf den Flügeldecken in den Reihen auf der Scheibe ziemlich große, längliche, tief eingeschnittene Punkte, die durch zarte Linien miteinander verbunden sind; Interstitien auf der Scheibe flach, seitlich gewölbt, fein punktiert. Auf den Flügeldecken Farbstreifen in den Spektralfarben. Durch deutliche Mikroretikulierung herabgesetzter Glanz. Halsschild, Fühler und Beine schwarz.

Besitzt eine ähnliche Färbung der Oberseite wie *A. angustus* Gebien, 1913, der sympatrisch mit *A. eremitis* n. sp. vorkommt. *A. angustus* ist größer (Körperlänge 8,12–9,47 mm), breiter und von stabilerer Gestalt, die Fühler sind wesentlich länger, der Halsschild ist breiter und glänzend farbig (bei *A. eremitis* schwarz), die Stirn ist breiter und die Punkte der Reihen auf den Flügeldecken sind größer.

Eine ähnliche Größe, Form des Körpers, Punktierung der Reihen der Flügeldecken und Färbung der Oberseite besitzt *A. bakeri* n. sp., aber auch *A. bakeri* besitzt längere Fühler und eine breitere Stirn, der Halsschild ist breiter und farbig, die Mesotibiae sind gerade (bei *A. eremitis* in der basalen Hälfte deutlich gekrümmt) und die Tarsen sind braun (bei *A. eremitis* schwarz).

### Beschreibung

M a ß e : Länge 7,32 mm. Breite 3,58 mm. – Relationen: Breite/Länge des Halsschildes 1,62; Breite Hinterecken/Breite Vorderecken des Halsschildes 1,62. Länge/Breite der Flügeldecken 1,69; Länge Flügeldecken/Länge Halsschild 3,62; maximale Breite Flügeldecken/maximale Breite Halsschild 1,32.

F a r b e : Auf den Flügeldecken farbige Längsstreifen auf nicht wesentlich glänzendem Grund. Halsschild schwarz, kaum glänzend. Kopf, Unterseite, Beine (einschließlich Tarsen) und Fühler schwarz.

K o p f : Stirn mittelbreit, etwas breiter als die Länge des 3. Antennomers (wie 20:18). Wangen kaum von der Stirn abgegrenzt, nicht gewölbt, kurz. Stirnnaht weder eingeschnitten noch eingedrückt. Clypeus mittelweit vorgezogen, flach. Clypeus mit feinen, weitläufig stehenden, schlecht abgegrenzten Punkten. Die winzigen Pünktchen der Stirn sehr weitläufig stehend.

H a l s s c h i l d : Ziemlich schmal. Quer stark gewölbt, längs nicht so stark gewölbt. Seiten in der hinteren Hälfte subparallel, in der vorderen Hälfte verrundet etwas eingezogen. Vorderecken nicht vorstehend, herabgebogen. Vorderrand leicht ausgeschnitten. Seiten und Vorderrand durchgehend gerandet. Bei Aufsicht sind die Randungen der Seiten nur in den hinteren drei Viertel sehr schmal sichtbar. Bei Ansicht von der Seite sind die Vorder- und Hinterecken verrundet, die Vorderecken rechtwinklig, die Hinterecken stumpfwinklig. Oberseite mit kleinen, etwas unregelmäßig, aber ziemlich dicht stehenden Punkten.

S c u t e l l u m : Dreieckig, mit wenigen feinen Punkten.

F l ü g e l d e c k e n : Länglich oval, quer stark gewölbt, längs deutlich gewölbt. Größte Höhe etwa in der Mitte. Schulterbeulen angedeutet. Enden der Flügeldecken gemeinsam verrundet. Seitenrandkanten von oben kaudad der Schultern sehr schmal sichtbar. Auf der Oberseite Punktreihen mit ziemlich großen, länglichen, tief eingedrückten Punkten, die durch feine Striche miteinander verbunden sind; die 4. und 5. Reihen sind sehr kurz, sie enden bereits zu Beginn des hinteren Teils; die Abstände der Punkte auf der Scheibe in der 4. Reihe stehen etwas unregelmäßig, entsprechen etwa dem ½- bis 2-fachen der Punktdurchmesser; in der 4. Reihe etwa 17 Punkte. Interstitien auf der Scheibe annähernd flach, seitlich etwas gewölbt, mit feinen, weitläufig stehenden Punkten.

P r o s t e r n u m : Vorderrand seitlich schmal aufgebogen, median etwas zur Apophyse hin eingezogen und einen kurzen, breiten Kiel in die Apophyse hinein sendend. Apophyse neben den Hüften deutlich verbreitert und etwas ventrad angehoben; dazwischen median eine breite Furche; hinter den Hüften verengen sich die Seiten; apikal verrundet; auf der Oberfläche hinter den Hüften finden sich querstrichige Strukturen.

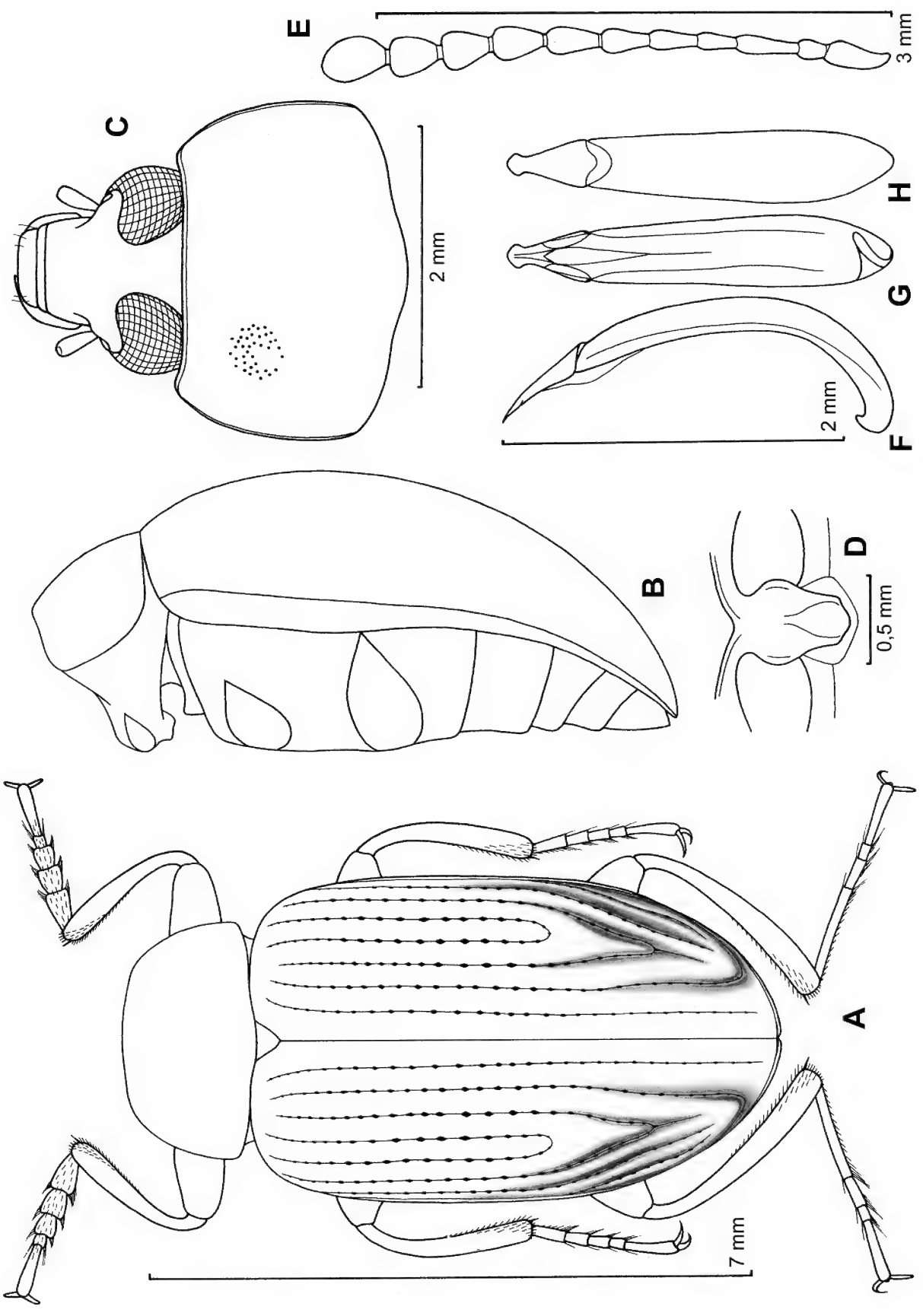


**Abb. 8.** *Amarygmus eremitis* n. sp. – **A** Habitus, ♂. **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Fühler. **F** Aedoeagus lateral. **G** Aedoeagus ventral. **H** Aedoeagus dorsal.

Mesosternum: Vorderrand des hinteren Teils median deutlich ausgeschnitten, Ecken des Ausschnitts etwas angehoben, Seiten verengen sich nach hinten.

Metasternum: Schwach mikroretikuliert. Vorderrand zwischen den Mesocoxae verrundet, gerandet; der davon begrenzte Bezirk etwas angehoben und median zwischen dieser Apophyse und der Scheibe mit einem kleinen Eindruck. Scheibe vorne mit zwei Reihen kleiner Punkte, dahinter mit sehr weitläufig stehenden, winzigen Punkten. Mediane Sutur in der ganzen Länge schwach eingedrückt.

Sternite: Durch starke Mikroretikulierung matter als Metasternum. Vorderrand des 1. Sternits zwischen den Metacoxae spitzbogig, gerandet. Sternite 1 und 2 mit kleinen, dicht stehenden Punkten, untermischt mit längsstrichigen Strukturen. Sternite 4 und 5 feiner und weitläufiger als die vorderen Sternite punktiert. Analsternit apikomedian schwach eingedrückt (sicher nur beim ♂).

Fühler: Ziemlich kurz, zurückgelegt etwa ein Viertel der Flügeldecken überlappend. Die Längen und Breiten der Antennomeren 1–11 verhalten sich wie 12:7½ / 9:6½ / 18:6 / 13:6 / 14:6 / 12:6½ / 16:9 / 16:10 / 16:11 / 15:11 / 19:13.

Beine: Kurz. Femora zum zweiten Drittel hin stark keulenförmig verdickt. Protibiae apikad verdickt und etwas gekrümmt. Mesotibiae in der basalen Hälfte gekrümmt, in der apikalen Hälfte annähernd gerade. Metatibiae apikad verdickt, gekrümmt. Protarsomeren 1–3 beim ♂ sehr stark verbreitert, aber in abnehmender Tendenz. Die Längen der Protarsomeren 1–5 sind 14:11:9:7:31, die der Mesotarsomeren 1–5 sind 18:14:11:8:32, die der Metatarsomeren 1–4 sind 49:19:11:32.

Aedoeagus: Siehe Abb. 8F-H.

## *Amarygmus hylaeus* **n. sp.**
(Abb. 9A–I)

Holotypus (♂): Philippines, 1600 m, Mindanao, 30 km W of Maramag, 29.–30.XII.1990, Bolm leg. (NHMB).

### Etymologie

Hylaeus (griech.), von Ὑλαῖος Waldmann.

### Diagnose

Langgestreckt. Flügeldecken mit subparallelen Seiten, auf ihnen Punktreihen mit sehr großen, weit voneinander entfernt liegenden Punkten. Protarsomeren 1–3 beim ♂ stark verbreitert und verlängert. Stirn ziemlich breit. Oberseite farbig metallisch.

Gehört in die Gruppe mittelgroßer, länglicher Arten mit stark verbreiterten Protarsomeren. Unterscheidet sich von allen ähnlichen Arten durch die Größe der Punkte in den Reihen der Flügeldecken.

### Beschreibung

Maße: Länge 7,88 mm. Breite 3,90 mm. – Relationen: Breite/Länge des Halsschildes 1,84; Breite Hinterecken/Breite Vorderecken des Halsschildes 1,76. Länge/Breite der Flügeldecken 1,65; Länge Flügeldecken/Länge Halsschild 3,68; maximale Breite Flügeldecken/maximale Breite Halsschild 1,21.

Farbe: Oberseite einschließlich Stirn grün, glänzend, mit Reflexionen in den Spektralfarben. Beine einschließlich Tarsen und Fühler schwarz. Haare an den Beinen gelbbraun. Unterseite schwarz, leicht glänzend.

Kopf: Stirn ziemlich breit, deutlich breiter als die Länge des 3. Antennomers (wie 31:19). Wangen an den Seiten des Kopfes gelegen, gering gewölbt, weiter als der mittlere Teil der Stirnnaht nach vorne reichend. Stirnnaht nur median schmal eingeschnitten und eingedrückt. Clypeus gegenüber der Stirnnaht mittelweit vorgezogen, gegenüber dem Vorderrand der Wangen gering vorgezogen. Clypeus mit flachen, kleinen, ziemlich dicht stehenden Punkten. Stirn mit ebensolchen Punkten, die aber unregelmäßig stehen. Mentum umgekehrt trapezförmig, mit leicht verrundeten Seiten, ebenen Seitenrändern; median dazwischen etwas gewölbt und glänzend. Unterseite des Halses mit kleinen, dicht stehenden, flachen Punkten. Mandibeln außen gefurcht, apikal bifid.

Halsschild: Nicht sehr breit. Quer stark gewölbt, längs etwas gewölbt. Seiten verengen sich verrundet nach vorne. Vorderecken von oben nicht sichtbar. Vorderrand sehr wenig ausgeschnitten. Seiten und Vorderrand durchgehend gerandet. Bei Aufsicht sind die Randungen der Seiten nur in der hinteren Hälfte sichtbar. Bei Ansicht von der Seite sind die verrundeten Vorderecken stark stumpfwinklig, die eckigen Hinterecken annähernd rechtwinklig. Oberseite mit feinen, weitläufig stehenden Punkten.

Scutellum: Dreieckig, unpunktiert.

Flügeldecken: Langgestreckt, schmal, kurz hinter den Schultern bis kurz vor Beginn des hinteren Drittels mit subparallelen Seiten. Quer stark gewölbt, längs deutlich gewölbt; Größte Höhe kurz vor der Mitte. Schulterbeulen angedeutet. Enden der Flügeldecken gemeinsam verrundet. Seitenrandkanten von kurz hinter den Schultern bis zum Beginn des hinteren Drittels von oben schmal sichtbar. Oberseite mit Punktreihen sehr großer, weit auseinander liegender Punkte; etwa 11 Punkte in der 4. Reihe. Interstitien schmal, meist schmaler als der Durchmesser der Punkte in den Punktreihen, mit winzigen, weitläufig stehenden Pünktchen.

Prosternum: Vorderrand schmal aufgebogen, median deutlich zur Apophyse hin eingezogen. Apophyse relativ schmal, neben den Hüften sind die Seiten und die Seitenränder verbreitert und letztere ventrad angehoben; dazwischen an dieser Stelle median eine schmale, tiefe Furche; hinter den Hüften kaudad vorgezogen und die Seiten subparallel; apikal breit verrundet.

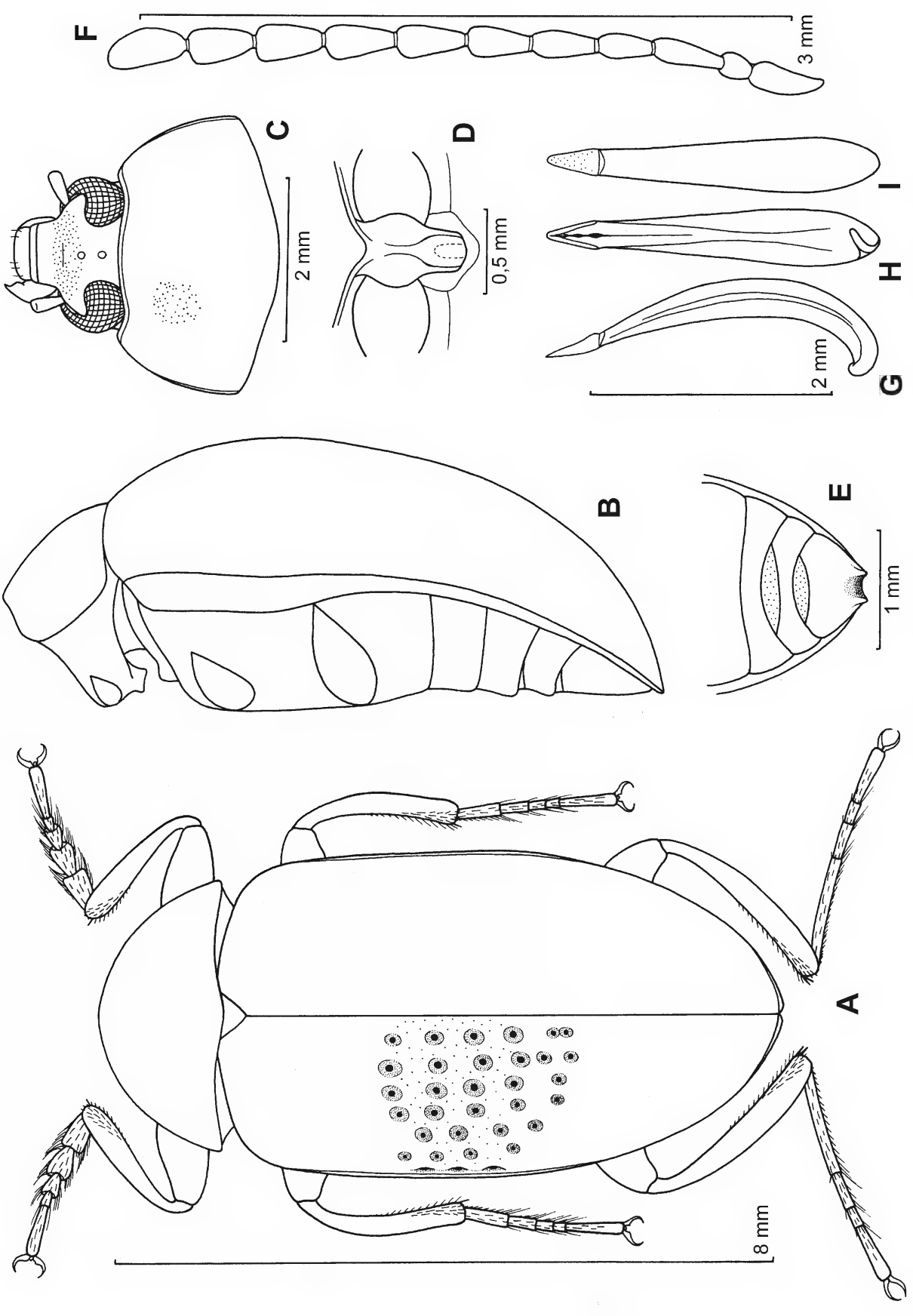


**Abb. 9.** *Amarygmus hylaeus* n. sp. – **A** Habitus, ♂. **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Sternite 3–5, ♂. **F** Fühler. **G** Aedoeagus lateral. **H** Aedoeagus ventral. **I** Aedoeagus dorsal.

Mesosternum: Hinterer Teil schmal, lang, nach hinten etwas verschmälert, vorne median tief ausgeschnitten.

Metasternum: Auf der Scheibe nicht mikroretikuliert, seitlich deutlich mikroretikuliert. Vorderrand zwischen den Mesocoxae schmal verrundet, gerandet. Im vorderen Teil mit einigen kleinen Punkten, dahinter mit weitläufig stehenden, winzigen Punkten. Medianlinie in der ganzen Länge etwas eingedrückt und angedeutet eingeschnitten.

Sternite: Etwas mikroretikuliert. Vorderrand des 1. Sternits zwischen den Metacoxae schmal spitzbogig, gerandet. Auf den Sterniten 1 und 2 einige verwaschene, kleine Punkte. Beim ♂ Intersegmentalmembranen zwischen den Sterniten 3 und 4 sowie 4 und 5 stark verbreitert, Sternite 3 und 4 dadurch median verkürzt. Analsternit apikomedian eingedrückt und am apikalen Rand ausgeschnitten.

Fühler: Von mittlerer Länge, zurückgelegt etwas mehr als das erste Drittel der Flügeldecken überlappend. Antennomer 11 apikal verrundet. Die Längen und Breiten der Antennomeren 1–11 verhalten sich wie 16:9 / 8:7½ / 19:7½ / 16:8 / 18:9 / 19:10 / 20:10 / 21:10½ / 19:10½ / 19:10½ / 25:11.

Beine: Kurz. Femora zum zweiten Drittel hin stark keulenförmig verdickt. Protibiae im basalen Drittel etwas gekrümmt; apikal davon außen gerade, an der Innenseite apikad verdickt; apikal an der Innenseite beim ♂ mit einem kleinen Feld dicht stehender Haare. Mesotibiae in der basalen Hälfte außen stark gekrümmt, apikad davon gerade, innen in der apikalen Hälfte gerade; basal ziemlich dünn, dann apikad deutlich verbreitert; an der Innenseite apikal beim ♂ mit einem Feld dicht stehender Haare. Metatibiae apikad etwas verdickt und insgesamt leicht gekrümmt. Protarsomeren 1–3 beim ♂ verlängert und verbreitert (von 1–3 in der Breite abnehmend). Die Längen der Protarsomeren 1–5 sind 15:14:10:7:30, die der Mesotarsomeren 1–5 sind 22:19:11:9:31, die der Metatarsomeren 1–4 sind 58:21:11:33.

Aedoeagus: Siehe Abb. 9G-I.

## *Amarygmus iuventus* **n. sp.**
(Abb. 10A–H)

Holotypus (♂): Asia Hot Spring, Baguio, N Luzon, Philippines, 20.–23.III.1978, leg. K. Matsuda (CM).

Paratypen: Gleiche Funddaten wie Holotypus (1 ♀ CM). – Philipp., Kraatz (1 ♀ ZSM; Antennomer 11 links, Antennomeren 4–11 rechts, rechtes Mittelbein und linke Metatarsomeren 1–4 fehlen). – Asin (Phil.), 30.IV.1978, T. Ochi (1 ♂ ZSMB).

Anmerkung: Holotypus und Paratypus aus Baguio waren verpilzt. Die auf der Zeichnung nicht mehr vorhandenen Antennomeren 9–11 waren bei der Messung der Längen und Breiten der Antennomeren noch vorhanden; sie gingen bei der anschließenden Reinigung und Entfernung des Pilzmycels verloren.

### Etymologie

Iuventus (lat.) = Jüngling.

### Diagnose

Klein, langgestreckt, oval, mit der größten Breite nach etwa einem Fünftel der Flügeldecken, nach hinten oval verschmälert, quer stark gewölbt. Striae der Flügeldecken mit kleinen Punkten, die in einiger Entfernung voneinander liegen; Interstitien auf der Scheibe flach, seitlich leicht gewölbt. Stirn mittelbreit, bei den ♀♀ etwas breiter als bei den ♂♂. Fühler nicht sehr lang, bei den ♂♂ etwas länger als bei den ♀♀. Protarsomeren 1–3 der ♂♂ leicht verbreitert und verlängert. Oberseite dunkel kupfrig, matt, mit farbigen, nicht sehr intensiven Reflexionen.

Sehr ähnlich in Form und Färbung dem *A. prolixus* n. sp., ebenfalls aus Luzon. *A. iuventus* ist etwas länger als *A. prolixus* (Körperlänge 4,36–5,33 mm), die Stirn ist wesentlich schmaler und die Punkte in den Striae auf den Flügeldecken sind deutlicher und etwas weiter voneinander entfernt. Bei den ♂♂ von *A. iuventus* fehlt an der Innenseite der Metatibiae nach etwa dem ersten Viertel basal eine bis zum Apex reichende plötzliche Erweiterung (bei *A. prolixus* vorhanden).

### Beschreibung

Maße: Länge 5,73–6,09 mm. Breite 2,91–3,07 mm. – Relationen: Breite/Länge des Halsschildes 1,74–1,88; Breite Hinterecken/Breite Vorderecken des Halsschildes 1,59–1,72. Länge/Breite der Flügeldecken 1,66–1,71; Länge Flügeldecken/Länge Halsschild 3,81–3,94; maximale Breite Flügeldecken/maximale Breite Halsschild 1,24–1,27.

Farbe: Oberseite dunkel kupferfarben, matt, mit nicht sehr intensiven, farbigen Reflexionen, besonders grünblau bis violett. Femora und Tibiae dunkelbraun. Antennomeren 1–5 braun, 6–11 schwarzbraun. Unterseite braun, glänzend.

Kopf: Kopfoberseite flach, ohne sichtbare Trennlinien zwischen Stirn und Wangen oder Clypeus. Stirn mittelbreit, beim ♂ etwas breiter als die Länge des 3. Antennomers (wie 15:12), beim ♀ etwa so breit wie die Summe der Längen der 3. und 4. Antennomeren. Wangen nicht gewölbt. Eine Stirnnaht ist nicht sichtbar. Clypeus nur wenig gegenüber Vorderrand der Wangen vorgezogen. Oberfläche mit feinen, weitläufig stehenden Punkten. Mentum trapezförmig, mit flachen, glänzenden Seitenrändern; dazwischen median matt, querüber gewölbt. Unterseite des Halses mit flachen, eng stehenden, kleinen Punkten. Mandibeln außen gefurcht, apikal bifid.

Halsschild: Setzt in der Längswölbung die Wölbung der Flügeldecken fort. Quer deutlich und gleichmäßig gewölbt. Seiten verengen sich verrundet nach vorne. Vorderecken verrundet. Vorderrand nicht ausgeschnitten. Seiten und Vorderrand durchgehend gerandet. Bei Auf-

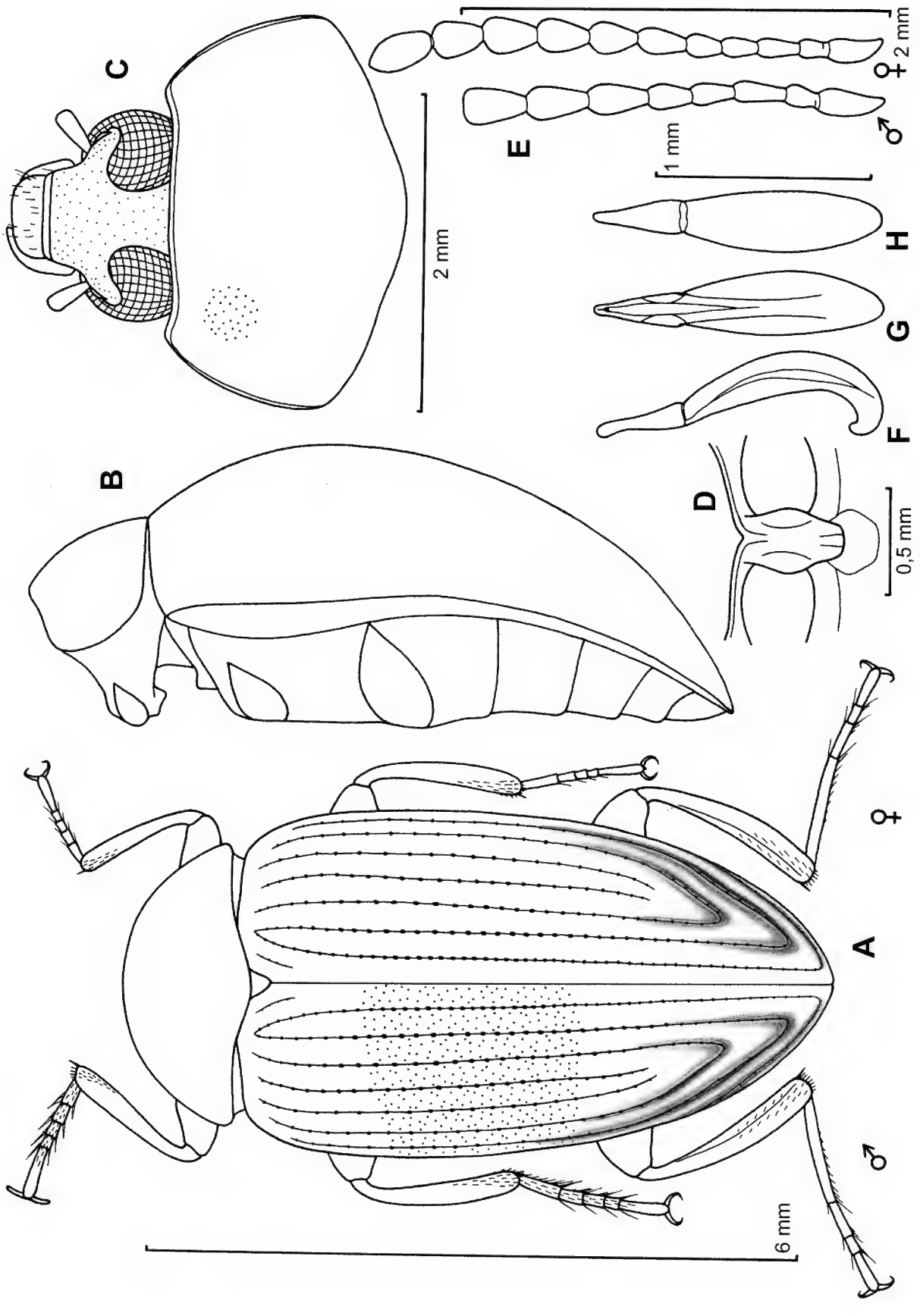


**Abb. 10.** *Amarygmus inventus* n. sp. – **A** Habitus; linksseitig Beine ♂, rechtsseitig Beine ♀. **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Fühler, ♂ und ♀. **F** Aedoeagus lateral. **G** Aedoeagus ventral. **H** Aedoeagus dorsal.

sicht sind die Randungen der Seiten sehr schmal sichtbar. Bei Ansicht von der Seite sind die Vorder- und Hinterecken stumpfwinklig. Oberseite mit winzigen, sehr weitläufig stehenden Pünktchen.

Scutellum: Dreieckig, unpunktiert.

Flügeldecken: Sehr langgestreckt und schmal, quer sehr stark gewölbt, längs deutlich gewölbt. Größte Breite und Höhe weit vorne, etwa nach einem Fünftel, dahinter leicht gebogen bis zum Apex verengt. Schulterbeulen sehr schwach entwickelt. Enden der Flügeldecken gemeinsam verrundet. Seitenrandkanten von oben nur in der Mitte sehr schmal sichtbar. Auf der Oberseite durchgehend schwach eingeschnitten, in ihnen kleine Punkte, die in der 4. Stria auf der Scheibe Abstände voneinander haben, die etwa dem 3-fachen der Punktdurchmesser entsprechen. Interstitien auf der Scheibe flach, hinten und seitlich gewölbt, mit feinen, deutlichen, nicht sehr eng stehenden Punkten.

Prosternum: Vorderrand mit Ausnahme der Mitte schmal aufgebogen, median eingezogen und mit einem dreieckigen Kiel in Richtung Apophyse. Apophyse schmal, zwischen Vorderrand und Hüften etwas aufgebogen, dahinter etwas herabgebogen, aber trotzdem kaudad vorgezogen; neben den Hüften die Seiten etwas verbreitert und deutlich ventrad angehoben, dazwischen median mit einer engen, tiefen Furche; hinter den Hüften verengen sich die Seiten etwas; apikal verrundet.

Mesosternum: Hinterer Teil schmal, am Vorderrand median ausgeschnitten; Seitenränder schmal angehoben, zwischen Seitenrand und Mitte beiderseits gefurcht.

Metasternum: Beim ♂ kahl. Vorderrand zwischen den Mesocoxae verrundet, gerandet. Scheibe mit wenigen, weitläufig stehenden, feinen Punkten. Mediane Sutur in der gesamten Länge etwas eingeschnitten und eingedrückt.

Sternite: Vorderrand des 1. Sternits zwischen den Metacoxae schmal spitzbogig. Sternite mit weitläufig stehenden, feinen Punkten. Analsternit beim ♂ apikomedian großflächig, aber nicht tief eingedrückt.

Fühler: Beim ♂ zurückgelegt etwa ein Viertel der Flügeldecken überlappend, beim ♀ etwa ein Fünftel. Die Längen und Breiten der Antennomeren 1–11 verhalten sich beim ♂ wie 12:6 / 7½:5 / 12:5 / 10:5 / 10:5 / 13:6 / 13:7 / 14:7 / 14:7½ / 13:8 / 19:8½, beim ♀ wie 11:6 / 6:5 / 11:5 / 7:5 / 8:5 / 9:6 / 11:7½ / 12:8 / 12:8 / 11:8 / 15:8.

Beine: Kurz. Femora zum zweiten Drittel hin deutlich keulenförmig verdickt. Protibiae apikad etwas verdickt, gerade. Mesotibiae apikad verdickt, außen leicht gekrümmt, innen in den apikalen drei Viertel gerade. Metatibiae innen mit einer scharfen Kante, außen gekrümmt, innen in den apikalen drei Viertel annähernd gerade. Protarsomeren 1–3 etwas verbreitert und verlängert. Die Längen der Protarsomeren 1–5 beim ♂ sind 10:9:8:5:21, die der Mesotarsomeren 1–5 sind 16:11:9:7:21, die der Metatarsomeren 1–4 (von einem weiblichen Paratypus) sind 39:14:6:19.

Aedoeagus: Siehe Abb. 10F-H.

## *Amarygmus jaegeri* **n. sp.**
(Abb. 11A–H)

Holotypus (♂): Philippinen, Leyte, [handschriftlich] A. … [unleserlich] (NMHUB).

### Etymologie

Herrn Bernd Jaeger, Kustodie Coleoptera (NMHUB), als Dank für manche Hilfe dediziert.

### Diagnose

Groß, oval, nicht sehr stark gewölbt. Oberseite glänzend, kupferfarben. Auf den Flügeldecken Punktreihen mit großen Punkten, die durch sehr feine Linien miteinander verbunden sind. Stirn schmal. Fühler sehr lang und dünn. Beine ziemlich lang. Protarsomeren beim ♂ leicht verlängert und verbreitert. Rückseiten der Meso- und Metafemora beim ♂ mit langen Haaren.

Durch die Form des Körpers, die Länge der Fühler und den Sexualdimorphismus gehört *A. jaegeri* in die Gruppe um *A. spectabilis* (Gebien, 1921). Innerhalb dieser Gruppe ähnelt er durch die Größe und die Art der Punktreihen der Flügeldecken *A. antiquus* n. sp., ebenfalls aus Leyte. *A. antiquus* hat im Gegensatz zu *A. jaegeri* rötlich gefärbte Flügeldecken und die Punkte der Reihen sind etwas größer und nicht durch Linien miteinander verbunden.

### Beschreibung

Maße: Länge 11,1 mm. Breite 5,7 mm. – Relationen: Breite/Länge des Halsschildes 1,79; Breite Hinterecken/Breite Vorderecken des Halsschildes 1,69. Länge/Breite der Flügeldecken 1,48; Länge Flügeldecken/Länge Halsschild 3,75; maximale Breite Flügeldecken/maximale Breite Halsschild 1,42.

Farbe: Flügeldecken dunkel kupferfarben, glänzend. Halsschild dunkler als Flügeldecken, glänzend. Kopfoberseite schwarz, glänzend. Beine schwarzbraun. Antennomeren schwarzbraun bis schwarz. Unterseite schwarz. Metasternum glänzend, Sternite durch starke Punktierung matter.

Kopf: Stirn sehr schmal, die Breite entspricht etwa der Länge des 2. Antennomers. Wangen schmal, kurz, gering gewölbt. Stirnnaht eingedrückt. Clypeus vorgezogen, längs und quer etwas gewölbt. Clypeus und Stirn fein und ziemlich dicht punktiert. Mentum umgekehrt trapezförmig, mit schmalen, flachen, glänzenden Seiten; querüber dazwischen matt, mit feinen Körnern. Unterseite des Halses mit kleinen, nicht sehr dicht stehenden Punkten. Mandibeln außen gefurcht, apikal bifid.

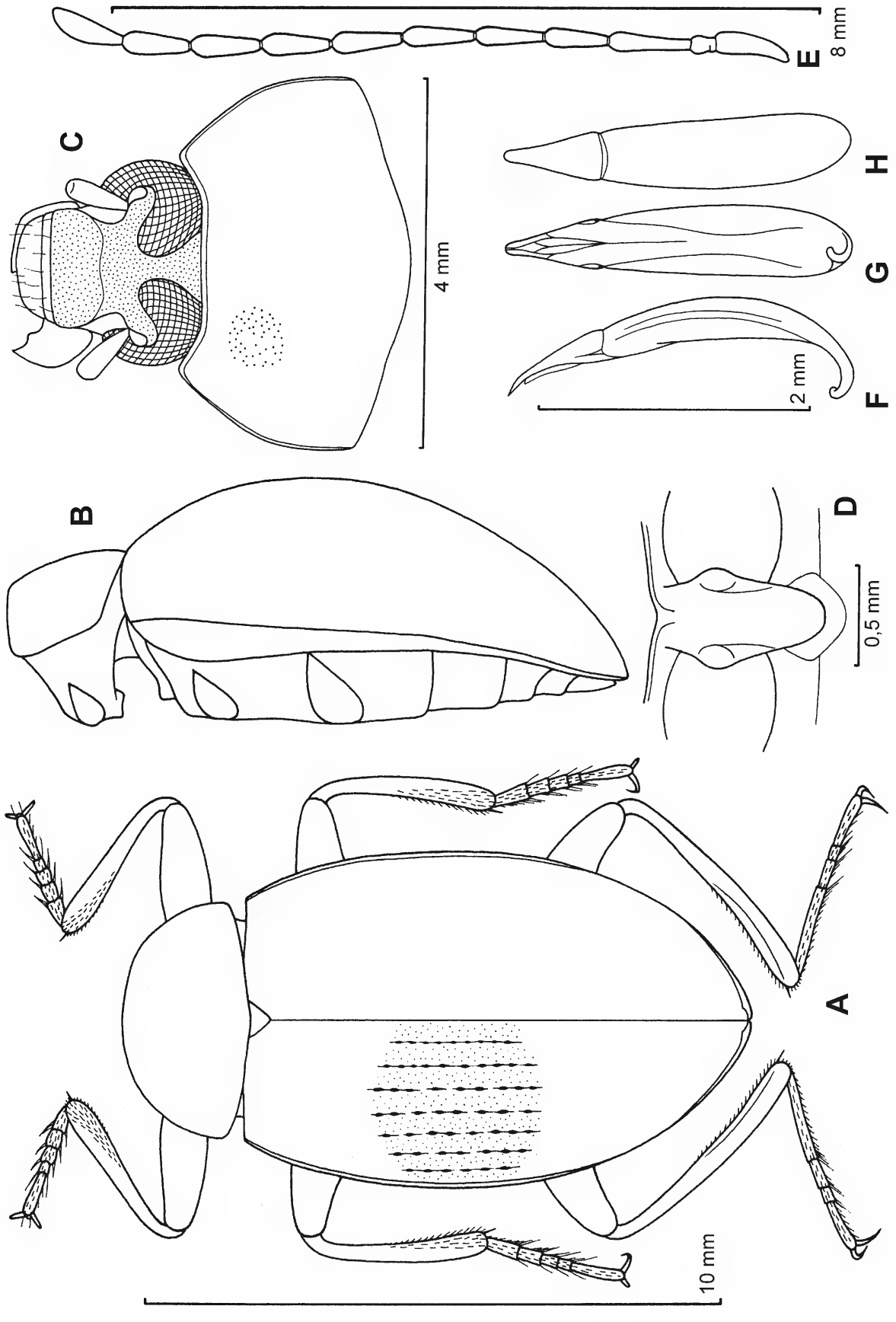


**Abb. 11.** *Amarygmus jaegeri* n. sp. – **A** Habitus, ♂. **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Fühler. **F** Aedoeagus lateral. **G** Aedoeagus ventral. **H** Aedoeagus dorsal.

Halsschild: Ziemlich kurz, nicht sehr breit. Quer deutlich gewölbt, längs etwas weniger gewölbt. Seiten in der hinteren Hälfte subparallel, davor gebogen und apikad davon mit geraden Seiten bis zu den Vorderecken verengt. Vorderrand ausgeschnitten, dadurch stehen die Vorderecken etwas vor. Seiten und Vorderrand durchgehend gerandet. Bei Aufsicht sind die Randungen der Seiten in der ganzen Länge schmal sichtbar. Bei Ansicht von der Seite sind die Vorderecken rechtwinklig, die Hinterecken stumpfwinklig. Oberseite mit feinen, ziemlich dicht stehenden Punkten.

Scutellum: Dreieckig, mit wenigen winzigen Punkten.

Flügeldecken: Länglich oval, längs und quer für *Amarygmus*-Arten nicht sehr stark gewölbt. Größte Breite und Höhe etwas vor der Mitte. Schulterbeulen angedeutet. Enden der Flügeldecken gemeinsam verrundet. Seitenrandkanten breit seitlich exponiert und in der ganzen Länge von oben sichtbar. Auf der Oberseite Punktreihen ziemlich großer, zum Teil rhombischer Punkte, die durch sehr feine Linien miteinander verbunden sind; die Abstände der Punkte voneinander sind unterschiedlich, einige sind sehr stark einander genähert, andere haben einen Abstand voneinander, der dem 3-fachen der Punktdurchmesser entspricht; die Punkte in den ersten zwei Reihen sind kleiner und einander stärker genähert; in der 4. Reihe etwa 28 Punkte. Interstitien auf der Scheibe flach, seitlich sehr leicht gewölbt, mit winzigen Punkten.

Prosternum: Vorderrand seitlich schmal aufgebogen, median zur Apophyse hin eingezogen und mit einem kurzen Kiel in Richtung Apophyse. Apophyse nicht sehr breit, neben den Hüften etwas verbreitert und Seiten leicht angehoben, dort median mit einer flachen Furche; hinter den Hüften verengen sich die Seiten etwas, apikal schmal verrundet und apikomedian etwas angehoben; mit vielen ungerichtet stehenden, mittellangen Haaren.

Mesosternum: Hinterer Teil schmal, kaudad verschmälert und an den seitlichen Rändern mit einer schmalen Leiste, median am Vorderrand tief ausgeschnitten.

Metasternum: Vorderrand zwischen den Mesocoxae verrundet, gerandet. Die vom Vorderrand halb eingefasste Apophyse etwas angehoben und fast punktfrei. Vorderer Bereich der Scheibe und auch seitlich mit dicht stehenden, kleinen Punkten, dahinter nahezu unpunktiert. Mediane Sutur nur hinten sehr schwach eingeschnitten.

Sternite: Vorderrand des 1. Sternits zwischen den Metacoxae spitzbogig, schmal gerandet. Sternite 1 und 2 dicht, klein punktiert. Sternit 3 vorne ebenfalls dicht, aber kleiner punktiert. Sternite 4 und 5 mit feinen, nicht sehr dicht stehenden Punkten. Sternit 5 apikomedian mit einer flachen Depression (sicher nur beim ♂).

Fühler: Lang, dünn, zurückgelegt über die Mitte der Flügeldecken hinaus reichend. Die Längen und Breiten der Antennomeren 1–11 verhalten sich wie 18:6 / 6:5½ / 23:5½ / 17:5½ / 20:6 / 20:6 / 20:6 / 20:6 / 20:6 / 19:6 / 23:6½.

Beine: Mittellang. Femora deutlich die Seiten des Körpers überragend, zum zweiten Drittel hin etwas keulenförmig verdickt; an den Rückseiten der Meso- und Metatibiae in der basalen Hälfte zarte, lange Haare (sicher nur beim ♂). Protibiae apikad an der Innenseite in der apikalen Hälfte leicht verdickt; außen angedeutet konkav; an der Innenseite apikal ein kleines Feld kurzer, dicht stehender Haare (sicher nur beim ♂). Mesotibiae apikad verdickt, in den basalen vier Fünftel annähernd gerade, im apikalen Fünftel leicht nach innen gebogen, an der Innenseite in den apikalen zwei Fünftel mit einem Feld kurzer, dicht stehender Haare (sicher nur beim ♂). Metatibiae in den basalen drei Fünftel gerade, in den apikalen zwei Fünftel leicht nach innen gebogen. Protarsomeren 1–3 beim ♂ etwas verlängert und verbreitert und auf der Sohlenfläche bürstenartig dicht behaart. Die Längen der Protarsomeren 1–5 sind 8:7:6:5:20, die der Mesotarsomeren 1–5 sind 11:9:6:6:21, die der Metatarsomeren 1–4 sind 30:14:7:20.

Aedoeagus: Siehe Abb. 11F-H.

### *Amarygmus langeri* **n. sp.**
(Abb. 12A–H)

Holotypus (♂): Philippinen, Romblon, 1982, leg. Witzgall (SMNS).

Paratypus: Gleiche Funddaten wie Holotypus (1 ♂ ZSMB).

#### Etymologie

Benannt nach Herrn Michael Langer (Niederwiesa), der mir freundlicherweise diese Tiere zur Bearbeitung zuschickte und den Holotypus dem SMNS überließ.

#### Diagnose

Mittelgroß. Flügeldecken oval, quer und längs deutlich gewölbt. Fühler nicht sehr lang; Antennomeren 7–11 charakteristischerweise apikad nicht sehr stark verbreitert. Auf den Flügeldecken Punktreihen mittelgroßer Punkte und auf der Scheibe nicht gewölbte, feine, aber deutlich punktierte Interstitien. Vorderrand des Halsschildes deutlich ausgeschnitten. Flügeldecken und Halsschild farbig. Innenseite der Pro- und Mesotibiae der ♂♂ apikal mit mittellangen Haaren.

Gehört in die Gruppe um *A. philippinensis* Gebien, 1944, zu der neben *A. philippinensis* auch *A. vulcanus* n. sp. und *A. rugipectus* n. sp. gehören. Diese vier Arten besitzen eine ähnliche Gestalt und Größe und eine sehr ähnliche Fühlerform. *A. philippinensis* hat im Gegensatz zu *A. langeri* eine einheitlich anthrazitfarbene Oberseite. Der Vorderrand des Halsschildes ist bei *A. philippinensis* und *A. vulcanus* deutlich geringer ausgeschnitten als bei

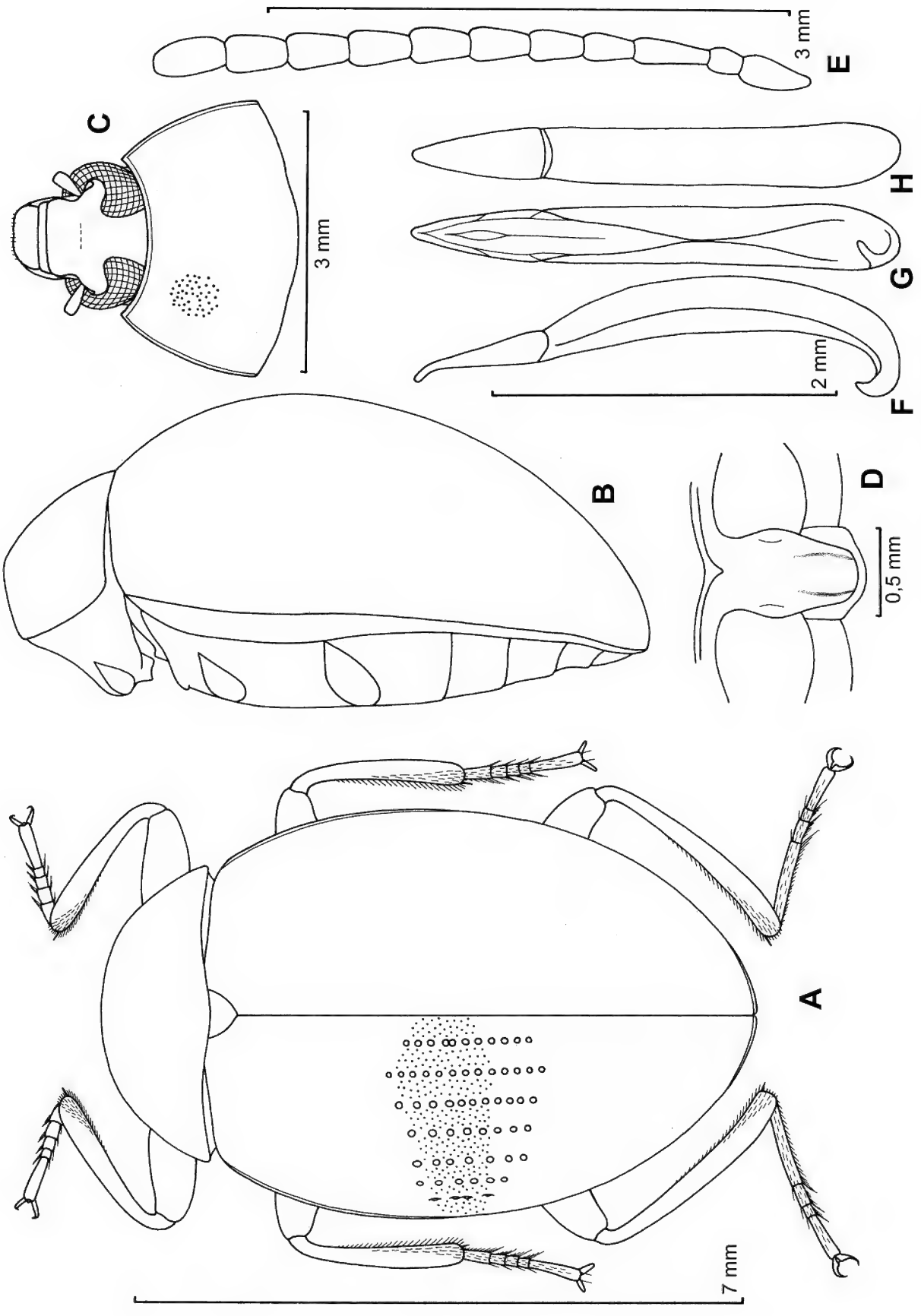


**Abb. 12.** *Amarygmus langeri* n. sp. – **A** Habitus, ♂. **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Fühler. **F** Aedoeagus lateral. **G** Aedoeagus ventral. **H** Aedoeagus dorsal.

*A. langeri*, dadurch stehen die Vorderecken des Halsschildes bei *A. langeri* spitz vor (nicht so bei *A. philippinensis* und *A. vulcanus*). Bei *A. philippinensis* sind ebenso wie bei *A. langeri* die Punkte der Punktreihen voneinander getrennt; sie sind nicht wie bei *A. rugipectus* und *A. vulcanus* durch feine Striche miteinander verbunden und als Striae nicht insgesamt eingedrückt wie bei *A. vulcanus*. Bei *A. langeri* und *A. philippinensis* sind die Interstitien auf der Scheibe nicht gewölbt (bei *A. vulcanus* sind sie etwas gewölbt, bei *A. rugipectus* auf der Scheibe nicht, aber seitlich angedeutet, gewölbt). Der Halsschild ist bei *A. langeri* blau, bei *A. vulcanus* grün, bei *A. philippinensis* anthrazitfarben, bei *A. rugipectus* wie die gesamte Oberseite blaugrün. Die Flügeldecken sind bei *A. vulcanus* nicht so deutlich farbig wie bei *A. langeri*. Die apikalen Haare an der Innenseite der Protibiae und Mesotibiae sind bei den ♂♂ von *A. langeri* länger als bei *A. philippinensis* und *A. vulcanus*.

## Beschreibung

Maße: Länge 7,25 + 8,12 mm. Breite 4,42 + 4,82 mm. – Relationen: Breite/Länge des Halsschildes 1,90 + 1,92; Breite Hinterecken/Breite Vorderecken des Halsschildes 1,84 + 1,86. Länge/Breite der Flügeldecken 1,35 + 1,36; Länge Flügeldecken/Länge Halsschild 3,42 + 3,57; maximale Breite Flügeldecken/maximale Breite Halsschild 1,32 + 1,39.

Farbe: Oberseite farbig. Flügeldecken je nach Winkel des Lichteinfalls zwischen purpurfarben bis schmutzig grün wechselnd, leicht glänzend. Halsschild blau, etwas glänzend. Stirn blau, Clypeus schwarz. Beine und Fühler schwarzbraun. Unterseite schwarz, leicht glänzend.

Kopf: Stirn mittelbreit, breiter als die Länge des 3. Antennomers (wie 22:27). Wangen gewölbt, nach vorne deutlich über die Mitte der Stirnnaht hinausreichend. Stirnnaht median leicht eingedrückt, nur sehr gering eingeschnitten. Clypeus vorgezogen, längs leicht gewölbt. Clypeus und Stirn mit kleinen, nicht sehr auffälligen Punkten. Mentum apikad verbreitert, mit leicht gebogenen Seiten, mit breiten, glänzenden, flachen Seitenrändern; dazwischen in der Mitte matt und quer etwas gewölbt. Mandibeln außen gefurcht, apikal bifid.

Halsschild: Quer und längs etwas gewölbt. Von hinten nach vorne verengt mit leicht gebogenen Seiten. Vorderecken scharf rechtwinklig. Hinterecken leicht stumpfwinklig. Vorderrand deutlich ausgeschnitten. Seitenränder und Vorderrand durchgehend gerandet. Bei Aufsicht sind die Randungen der Seiten in der ganzen Länge gut sichtbar. Bei Ansicht von der Seite sind die Vorderecken rechtwinklig, die Hinterecken leicht stumpfwinklig. Oberseite mit deutlichen, kleinen, ziemlich dicht stehenden Punkten.

Scutellum: Dreieckig, mit einigen winzigen Punkten.

Flügeldecken: Oval, quer stark, längs deutlich gewölbt. Größte Breite und Höhe zu Beginn des zweiten Drittels. Schulterbeulen angedeutet. Enden der Flügeldecken gemeinsam verrundet. Seitenrandkanten von oben in der vorderen Hälfte schmal sichtbar. Oberseite mit Punktreihen mittelgroßer, nicht verbundener Punkte, die auf der Scheibe in der 4. Reihe einen Abstand voneinander haben, der dem 1- bis 2-fachen der Punktdurchmesser entspricht; in der 4. Reihe etwa 25 Punkte. Interstitien auf der Scheibe eben, seitlich hinten angedeutet gewölbt, mit feinen, deutlichen Punkten.

Prosternum: Vorderrand durchgehend schmal aufgebogen, median etwas zur Apophyse hin eingezogen. Apophyse oval, ihre Seiten neben den Procoxae etwas ventrad angehoben, so dass dort median eine seichte Furche entsteht; mit einigen schräg aufgerichteten, kurzen Haaren.

Mesosternum: Hinterer Teil glatt, Vorderrand median tief ausgeschnitten.

Metasternum: Vorderrand zwischen den Mesocoxae verrundet, dick gerandet. Im vorderen Teil einige kleine Punkte und schrägstrichige Strukturen; der größte Teil der Scheibe mit ziemlich dicht stehenden, feinen Punkten, aus denen winzige bis kurze Härchen entspringen. Mediane Sutur weder eingeschnitten noch eingedrückt.

Sternite: Vorderrand des 1. Sternits zwischen den Metacoxae spitzbogig, gerandet. Die ersten zwei Sternite mit kleinen, verwaschenen Punkten, die dahinter liegenden Sternite mit noch kleineren Punkten, auf den Scheiben mit anliegenden, kurzen Haaren, auf dem Analsternit sind diese Haare etwas länger.

Fühler: Nicht sehr lang, zurückgelegt bei den ♂♂ etwa das Ende des ersten Drittels der Flügeldecken erreichend. Die Antennomeren 7–10 besitzen gerade Seiten und verbreitern sich apikad nur wenig. Die Längen und Breiten der Antennomeren 1–11 verhalten sich beim ♂ wie 15:9 / 11:8 / 22:8½ / 18:9 / 18:10 / 19:11 / 17:12 / 17:12 / 17:12 / 16:12 / 22:12.

Beine: Kurz. Femora zum zweiten Drittel hin keulenförmig verdickt. Protibiae apikad verdickt, annähernd gerade, bei den ♂♂ an der Innenseite im apikalen Drittel mit schräg abstehenden Haaren. Mesotibiae apikad verdickt, außen leicht gekrümmt, bei den ♂♂ an der Innenseite in der apikalen Hälfte mit ziemlich langen, abstehenden Haaren. Metatibiae apikad verdickt, in der basalen Hälfte annähernd gerade, in der apikalen Hälfte leicht nach innen gekrümmt und innen mit schräg abstehenden Borsten (wahrscheinlich bei beiden Geschlechtern). Protarsomeren 1–3 der ♂♂ nicht verbreitert. Die Längen der Protarsomeren 1–5 sind 9:9:8:8:29, die der Mesotarsomeren 1–5 sind 16:14:10:8:29, die der Metatarsomeren 1–4 sind 41:12:10:30.

Aedoeagus: Siehe Abb. 12F-H.

### *Amarygmus lugubris* **n. sp.**
(Abb. 13A–H)

Holotypus (♂): Philippines, Mt. Data, 2300 m, Bontoc Prov., Luzon, 7.–9.VI.1977, M. Sato leg. (CM).

#### Etymologie

Lugubris (lat.) = zur Trauer gehörig, aber auch schmutziges Oberkleid. Die Benennung erfolgte, weil der Holotypus vor der Reinigung eine schmutzige Oberseite aufwies.

#### Diagnose

Klein, kurz, oval; stark gewölbt. Oberseite schwarz. Flügeldecken mit starker Mikroretikulierung, teilweise mit Chagrinleder ähnlichen Strukturen. Halsschild glatt, leicht glänzend. Flügeldecken mit unscheinbaren Punktreihen kleiner Punkte. Fühler nicht sehr lang; Antennomeren 5–11 mit sehr dünner Basis. Pro- und Mesotarsomeren 1–3 beim ♂ deutlich verbreitert und verlängert.

Wegen der Körpergestalt und des Sexualdimorphismus gehört *A. lugubris* in die Nähe von *A. paradoxus* n. sp. und *A. nigellus* n. sp. Die Punkte der Punktreihen der Flügeldecken sind bei *A. paradoxus* ausgesprochen groß und auffallend, bei *A. lugubris* sind sie klein und unauffällig. *A. nigellus* hat im Gegensatz zu *A. lugubris* auf den Flügeldecken Striae.

#### Beschreibung

Maße: Länge 6,37 mm. Breite 3,98 mm. – Relationen: Breite/Länge des Halsschildes 1,94; Breite Hinterecken/Breite Vorderecken des Halsschildes 1,94. Länge/Breite der Flügeldecken 1,42; Länge Flügeldecken/Länge Halsschild 3,94; maximale Breite Flügeldecken/maximale Breite Halsschild 1,43.

Farbe: Flügeldecken schwarz, matt. Halsschild schwarz, leicht glänzend. Femora und Tibiae schwarzbraun, Tarsen hellbraun. Antennomeren 1–5 braun, 6–11 schwarz. Unterseite braun, leicht glänzend; Haare hellgelb.

Kopf: Stirn breit, so breit wie die Antennomeren 2+3 zusammen. Wangen kurz, nach vorne nicht die Mitte der Stirnnaht überschreitend. Stirnnaht nur durchscheinend, weder eingeschnitten noch eingedrückt. Clypeus kurz, gering quer gewölbt. Clypeus und Stirn mit kleinen, flachen, nicht sehr dicht stehenden Punkten. Mentum umgekehrt trapezförmig, Seiten flach, leicht glänzend; dazwischen querüber gewölbt, matt. Unterseite des Halses stark mikroretikuliert, mit großen, quer ausgerichteten, flachen Punkten. Mandibeln außen gefurcht, apikal bifid.

Halsschild: Seiten sehr deutlich nach vorne verengt, dabei in der hinteren Hälfte gebogen, in der vorderen Hälfte gerade. Quer in der Mitte deutlich gewölbt, seitlich zu flachen Flächen herabgedrückt, längs etwas gewölbt. Vorderecken stark herabgedrückt. Vorderrand gerade. Seitenränder und Vorderrand durchgehend gerandet. Bei Aufsicht sind die Randungen der Seiten nur in der hinteren Hälfte extrem schmal sichtbar. Bei Ansicht von der Seite sind die Vorderecken eckig, leicht stumpfwinklig, die Hinterecken verrundet und deutlich stumpfwinklig. Oberseite mit feinen, etwas unregelmäßig stehenden Punkten.

Scutellum: Dreieckig, unpunktiert.

Flügeldecken: Leicht länglich oval, ziemlich breit, quer stark gewölbt, längs deutlich gewölbt. Größte Breite und Höhe etwa in der Mitte. Schulterbeulen vorhanden. Enden der Flügeldecken gemeinsam verrundet. Seitenrandkanten von oben nicht sichtbar. Auf der Oberseite Punktreihen mit feinen, unscheinbaren Punkten, die in großem Abstand voneinander liegen; in der 4. Reihe etwa 32 Punkte. Interstitien flach, mit einzelnen winzigen Punkten, die wegen der starken Mikroretikulierung schwierig abzugrenzen sind.

Prosternum: Vorderrand durchgehend schmal aufgebogen, median deutlich winklig zur Apophyse hin eingezogen. Auffällige Apophyse mit schmaler Basis; die Seiten verbreitern sich deutlich zu den Procoxae hin, wo sie stark ventrad angehoben sind, dort dazwischen mit tiefer medianer Furche; hinter den Hüften sofort zur Basis herabgebogen; apikal mit einem schmalen, kurzen Mittelkiel.

Mesosternum: Hinterer Teil schmal, kurz. Vorderrand des hinteren Teils median nicht ausgeschnitten. Mit einigen kurzen, anliegenden Haaren.

Metasternum: Vorderrand zwischen den Mesocoxae schmal verrundet, dick gerandet. Scheibe mit mittellangen, nicht sehr dicht stehenden, halb aufgerichteten Haaren beim ♂ (♀ unbekannt). Mediane Sutur weder eingeschnitten noch eingedrückt.

Sternite: Vorderrand des 1. Sternits zwischen den Metacoxae mit geraden, spitzwinklig aufeinander zulaufenden Seiten, gerandet. Seitliche Bereiche der Sternite dicht längs geriefelt; die Scheiben (beim ♂) mit mittellangen, anliegenden Haaren. Analsternit apikomedian sehr tief eingedrückt.

Fühler: Relativ kurz, zurückgelegt etwa ein Fünftel der Flügeldecken überlappend. Antennomeren 5–11 durch schmale Basis deutlich voneinander abgegrenzt. Die Längen und Breiten der Antennomeren 1–11 verhalten sich wie 10:7 / 7:6 / 21:6 / 14:6 / 16:7 / 17:7 / 17:8 / 17:8½ / 15:9 / 14:9 / 18:9.

Beine: Mittellang. Femora zum zweiten Drittel hin stark keulenförmig verdickt. Protibiae gerade, beim ♂ ohne apikales Haarfeld an der Innenseite. Mesotibiae gerade, beim ♂ ohne apikales Haarfeld an der Innenseite. Metatibiae in den basalen drei Viertel sehr leicht gekrümmt, im apikalen Viertel etwas stärker gekrümmt. Pro- und Mesotarsomeren 1–3 beim ♂ etwas verbreitert und verlängert. Die Längen der Protarsomeren 1–5 sind 17:11:11:7:26, die der Mesotarsomeren 1–5 sind 20:11:9:6:27, die der Metatarsomeren 1–4 sind 46:14:8:27.

Aedoeagus: Siehe Abb. 13F-H.

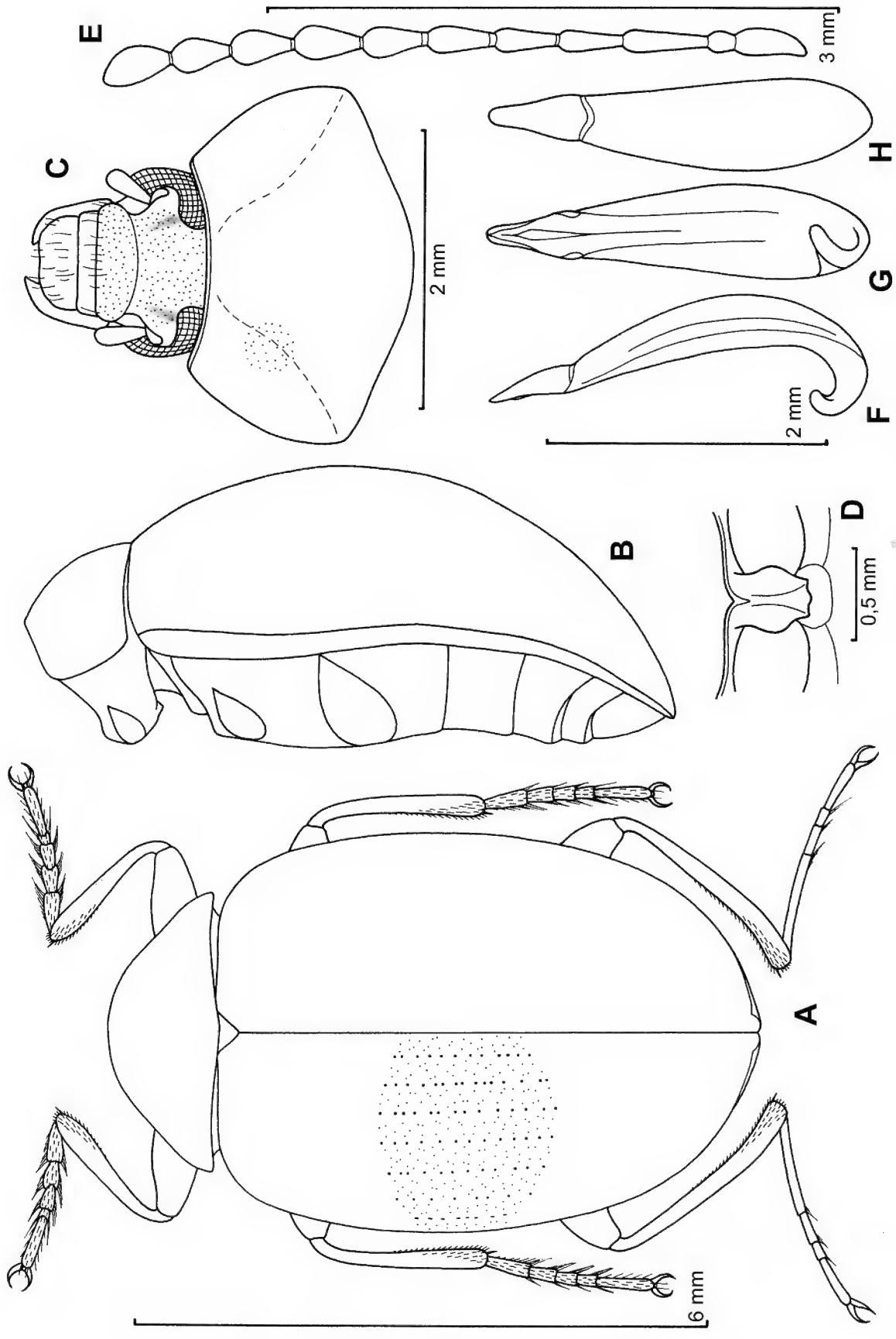


**Abb. 13.** *Amarygmus lugubris* n. sp. – **A** Habitus, ♂. **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Fühler. **F** Aedoeagus lateral. **G** Aedoeagus ventral. **H** Aedoeagus dorsal.

### *Amarygmus mendicus* **n. sp.**
(Abb. 14A–H)

Holotypus (♀): Ripong, N Luzon, Philippinen, BOETTICHER (NHMBF).

Paratypen: Gleiche Funddaten wie Holotypus (2 ♀♀ NHMBF, 2 ♀♀ ZSMB). – Ripong, N Luzon, Muséum Paris, Coll. P. ARDOIN 1975 (1 ♂ MNHP; Fühler unvollständig).

#### Etymologie

Mendicus (lat.) = sehr arm (an Färbung der Oberseite und Besonderheiten).

#### Diagnose

Unscheinbar, klein, oval. Striae der Flügeldecken mit mittelgroßen Punkten. Interstitien auf der Scheibe flach, seitlich angedeutet gewölbt, mit feinen, schütter stehenden Punkten. Halsschild und Stirn dunkelblau, leicht glänzend. Flügeldecken dunkel kupfrig, glänzend. Protarsomeren 1–3 beim ♂ nicht verbreitert.

Sehr ähnlich dem überall in der orientalischen Region sehr häufigen *A. micans* (Fabricius, 1794), von dem sich *A. mendicus* wahrscheinlich ableitet. Lange Zeit hatte ich, bis ich ein ♂ fand, die neue Art als Farbvariante von *A. micans* angesehen (die ♂♂ von *A. micans* haben ein dicht behaartes Metasternum, bei den ♂♂ von *A. mendicus* ist es unbehaart). *A. mendicus* fehlen die bei *A. micans* konstant vorhandenen farbigen Reflexionen auf Halsschild und Flügeldecken, insbesondere die leuchtend violetten Reflexionen der Flügeldecken. Diese Reflexionen sind bei *A. micans* in dem riesigen Verbreitungsgebiet immer in derselben Ausprägung vorhanden. Die Reflexionen sind durch physikalische Strukturbesonderheiten der Oberfläche bedingt, haben damit den Charakter von Strukturmerkmalen. Typische Exemplare von *A. micans* kommen sympatrisch mit denen von *A. mendicus* im nördlichen Luzon vor (aber in anderen Gegenden finden sich unter den Exemplaren von *A. micans* keine Exemplare mit den Besonderheiten von *A. mendicus*). Außerdem sind die Punkte der Striae bei *A. mendicus* etwas größer als bei *A. micans*, und *A. micans* ist etwas größer als *A. mendicus* (Körperlänge 4,90–5,93 mm). Daneben finden sich Unterschiede auf der Oberseite des Kopfes: Bei *A. mendicus* ist die Stirnnaht nur median schmal eingeschnitten oder sehr schwach eingedrückt, aber nicht so deutlich eingedrückt wie bei *A. micans*; der Clypeus ist bei *A. mendicus* längs nicht oder nur sehr schwach gewölbt, bei *A. micans* ist er deutlich gewölbt.

Sehr ähnlich ist die neue Art auch *A. cyaneipennis* Pic, 1938, der in demselben Gebiet vorkommt. Die Oberseite ist bei *A. cyaneipennis* immer leuchtend blau (ohne andersfarbige Reflexionen), die Flügeldecken sind bei *A. mendicus* geringer quer gewölbt als bei *A. cyaneipennis*, die Antennomeren 7–11 sind bei den ♀♀ von *A. mendicus* kürzer als bei den ♀♀ von *A. cyaneipennis* (bei dem einzigen ♂ von *A. mendicus* sind nur die Antennomeren 1–7 vorhanden).

In der Form des Körpers, der Struktur der Flügeldecken und der Breite der Stirn ähneln sich auch *A. mendicus* und *A. secretus* Bremer, 2002 von Borneo. *A. mendicus* ist aber etwas größer als *A. secretus* (Körperlänge 3,49–4,07 mm), die Fühler sind länger, der Halsschild schwarzblau (bei *A. secretus* dunkel kupfrig) und Clypeus und Stirn liegen ungefähr auf einer Ebene und sind getrennt durch eine schwach eingeschnittene Stirnnaht (bei *A. secretus* liegt die Stirn deutlich höher als der Clypeus).

#### Beschreibung

Maße: Länge 4,45–4,75 mm. Breite 2,45–2,50 mm. – Relationen: Breite/Länge des Halsschildes 1,71–1,78; Breite Hinterecken/Breite Vorderecken des Halsschildes 1,63–1,72. Länge/Breite der Flügeldecken 1,42–1,50; Länge Flügeldecken/Länge Halsschild 3,29–3,54; maximale Breite Flügeldecken/maximale Breite Halsschild 1,29–1,35.

Farbe: Halsschild schwarzblau. Flügeldecken dunkel kupfrig, glänzend. Beine dunkelbraun. Antennomeren 1–5 dunkelbraun, 5–11 schwarz. Unterseite dunkelbraun.

Kopf: Stirn nicht sehr breit, deutlich schmaler als die Länge des 4. Antennomers (wie 9:12). Wangen kurz, nur gering gewölbt. Stirnnaht bei einigen Exemplaren in der Mitte schwach und schmal eingeschnitten, bei anderen in der ganzen Breite schwach eingeschnitten und gebogen. Clypeus vorgezogen, nicht oder nur sehr schwach gewölbt. Clypeus und Stirn mit feinen, weitläufig stehenden Punkten. Mentum breit, umgekehrt trapezförmig, mit breiten, glänzenden Seitenrändern; quer nur sehr gering gewölbt. Unterseite des Halses mit sehr oberflächlich stehenden, kleinen Punkten. Mandibeln außen gefurcht, apikal bifid.

Halsschild: Nicht sehr breit. Quer stark gewölbt, längs deutlich gewölbt. Seiten verengen sich verrundet nach vorne. Vorderecken nicht vorgezogen. Vorderrand nur unwesentlich ausgeschnitten. Seiten und Vorderrand durchgehend gerandet. Bei Aufsicht sind die Randungen der Seiten in der ganzen Länge, aber schmal sichtbar. Bei Ansicht von der Seite sind die Vorderecken rechtwinklig, die Hinterecken stumpfwinklig. Oberseite mit kleinen, deutlichen, ziemlich dicht stehenden Punkten.

Scutellum: Dreieckig, mit wenigen winzigen Pünktchen.

Flügeldecken: Länglich oval, quer und längs nicht sehr stark gewölbt. Größte Breite und Höhe etwa in der Mitte. Schulterbeulen angedeutet. Enden der Flügeldecken gemeinsam verrundet. Seitenrandkanten von oben an den Schultern und am Apex sichtbar. Auf der Oberseite Striae mit mittelgroßen, meist runden, oft unregelmäßig stehenden Punkten, die in den ersten zwei Striae etwas enger als in den folgenden Striae stehen; in der 4. Stria entsprechen die Abstände der Punkte voneinander auf der Scheibe etwa dem Doppelten der Punktdurchmesser; in

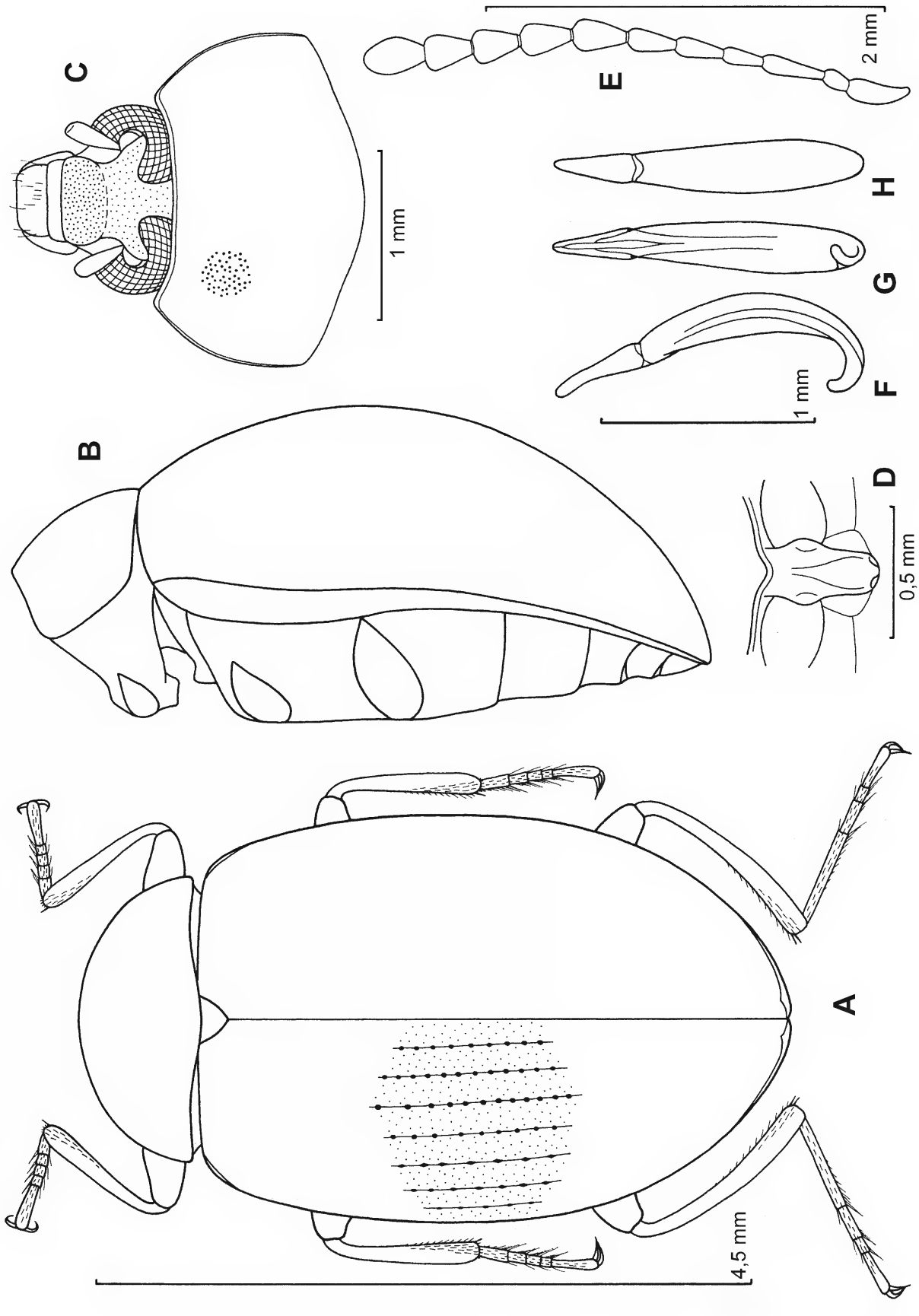


**Abb. 14.** *Amarygmus mendicus* n. sp. – **A** Habitus, ♂. **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Fühler, ♀. **F** Aedoeagus lateral. **G** Aedoeagus ventral. **H** Aedoeagus dorsal.

der 4. Stria etwa 24 Punkte. Interstitien auf der Scheibe flach, seitlich nur angedeutet gewölbt, mit feinen, gut sichtbaren, nicht sehr dicht stehenden Punkten.

Prosternum: Vorderrand durchgehend aufgebogen, beide Seiten median in einem stumpfen Winkel zusammenstoßend. Apophyse mittelbreit; Seiten neben den Hüften etwas verbreitert und Seitenränder deutlich ventrad aufgewölbt, median dazwischen tief gefurcht; Apophyse hinter den Hüften, leicht geneigt, kaudad vorgezogen; Seitenränder hinter den Hüften etwas angehoben und leicht verengt; apikal breit verrundet; da die Mitte apikal etwas angehoben ist, entsteht leicht der Eindruck, dass der mittlere Teil apikal etwas vorsteht; mit einigen kurz aufragenden Haaren.

Mesosternum: Vorderrand des hinteren Teils median etwas ausgeschnitten, Ränder des Ausschnitts leicht wulstartig; seitliche Ränder verengen sich etwas nach hinten; mit einigen kurzen, aufragenden Haaren.

Metasternum: Vorderrand zwischen den Mesocoxae breit verrundet und deutlich gerandet. Auf der Scheibe finden sich feine, weitläufig stehende Punkte, die beim ♂ etwas dichter als bei den ♀♀ stehen. Mediane Sutur in den hinteren drei Fünftel etwas eingedrückt.

Sternite: Vorderrand der Apophyse zwischen den Metacoxae schmal spitzbogig, gering gerandet. Sternite besonders seitlich und an den Vorderrändern der Segmente längs geriefelt. Insgesamt fein und weitläufig punktiert. Analsternit apikomedian beim ♂ ohne Eindruck.

Fühler: Ziemlich lang, zurückgelegt die Mitte der Flügeldecken erreichend. Die Längen und Breiten der Antennomeren 1–11 verhalten sich wie 15:6 / 7:5 / 16½:4½ / 12:4½ / 13:5 / 13:5½ / 15:8 / 13:8 / 13:8 / 13:8 / 17:8.

Beine: Kurz. Femora zum zweiten Drittel hin keulenförmig verdickt. Protibiae apikad an der Innenseite etwas verdickt, gerade. Mesotibiae sehr leicht gekrümmt. Metatibiae deutlich stärker als die Mesotibiae gekrümmt. Die Längen der Protarsomeren 1–5 sind 4:4:4:3:14, die der Mesotarsomeren 1–5 sind 11:7:5:3½:15, die der Metatarsomeren 1–4 sind 27:11:7:16.

Aedoeagus: Siehe Abb. 14F-H.

## *Amarygmus mindanaensis* **n. sp.**
(Abb. 15A–I)

Holotypus (♂): Surigao, Mindanao, Baker, *Amarygmus* [Gebiens Handschrift] *mindanaensis* Gb. (NHMBF).

Paratypen: Gleiche Funddaten wie Holotypus (1 ♂ ZSMB, 1 ♀ NHMBF). – Dapitan, Mindanao, Baker (1 ♀ NHMBF) (alle diese Typen etwas beschädigt). – Mt. Apo, Mindanao, 12.–18.V.1978, T. Mizunuma leg. (1 ♀ CM).

### Etymologie

Gebien (in litt.) bezeichnete diese Art als *mindanaensis* nach der Insel, von der diese Art stammt. Ich respektiere die Gebiensche Benennung.

### Diagnose

Klein, länglich oval. Flügeldecken mit Punktreihen großer, weit voneinander entfernt stehender Punkte. ♂♂ mit sehr breiten Protarsomeren 1–3 (Mesotarsomeren 1–3 nicht sehr verbreitert). Metatarsomer 1 so lang wie die folgenden Glieder zusammen. Unterseite der ♂♂ kahl.

Gehört in die Gruppe um *A. angustus* Gebien, 1913, der ebenso wie *A. mindanaensis* eine länglich ovale Gestalt, im männlichen Geschlecht stark verbreiterte Protarsomeren 1–3 sowie eine stark verbreiterte Membran zwischen den Sterniten 3 und 4 besitzt. Die meisten Arten dieser Gruppe sind wesentlich größer als *A. mindanaensis* (Länge > 7 mm). Nur *A. platolenoides* n. sp. hat eine ähnliche Größe wie *A. mindanaensis*, jedoch besitzt diese im Gegensatz zu *A. mindanaensis* Striae auf den Flügeldecken.

### Beschreibung

Maße: Länge 5,10–5,33 mm. Breite 2,95–3,00 mm. – Relationen: Breite/Länge des Halsschildes 1,88–1,95; Breite Hinterecken/Breite Vorderecken des Halsschildes 1,67–1,82. Länge/Breite der Flügeldecken 1,48–1,58; Länge Flügeldecken/Länge Halsschild 3,68–3,87; maximale Breite Flügeldecken/maximale Breite Halsschild 1,28–1,32.

Farbe: Oberseite mikroretikuliert und dadurch Glanz herabgesetzt. Kopfoberseite und Halsschild braun. Flügeldecken farbig, je nach Winkel des Lichteinfalls in einer anderen Farbe. Unterseite schwarz, mikroretikuliert, kaum glänzend. Fühler schwarzbraun. Beine schwarzbraun, Tarsen etwas heller braun.

Kopf: Stirn mittelbreit, etwas breiter als die Länge des 3. Antennomers (wie 16:14). Wangen etwas weiter nach vorne reichend als die Mitte der Stirnnaht, leicht gewölbt. Stirnnaht median etwas eingedrückt (quer etwa von der Breite der Stirn). Clypeus mittelweit vorgezogen, quer sehr leicht gewölbt. Clypeus und Stirn mikroretikuliert, mit feinen, weitläufig stehenden Punkten. Mentum apikad verbreitert, mit breiten, flachen, etwas verrundeten, glänzenden Seitenrändern; median quer etwas gewölbt, matt. Mandibeln außen gefurcht, apikal bifid.

Halsschild: Quer gleichmäßig und deutlich gewölbt, längs leicht gewölbt. Seiten verengen sich nach vorne, in der hinteren Hälfte annähernd gerade, davor etwas gebogen (bei einem Paratypus gleichmäßig verengt). Vorderrand etwas ausgeschnitten und median sehr leicht nach vorne vorstehend. Bei Aufsicht erscheinen die Vorderecken verrundet. Seitenränder und Vorderrand durchgehend gerandet. Bei Ansicht von oben sind die Randungen der Seiten vorne ebenso wie die Vorderecken nicht sichtbar, hinten sehr schmal sichtbar. Bei Ansicht von der Seite sind die Vorderecken breit verrundet und deutlich stumpfwinklig, die eckigen Hinterecken annähernd recht-

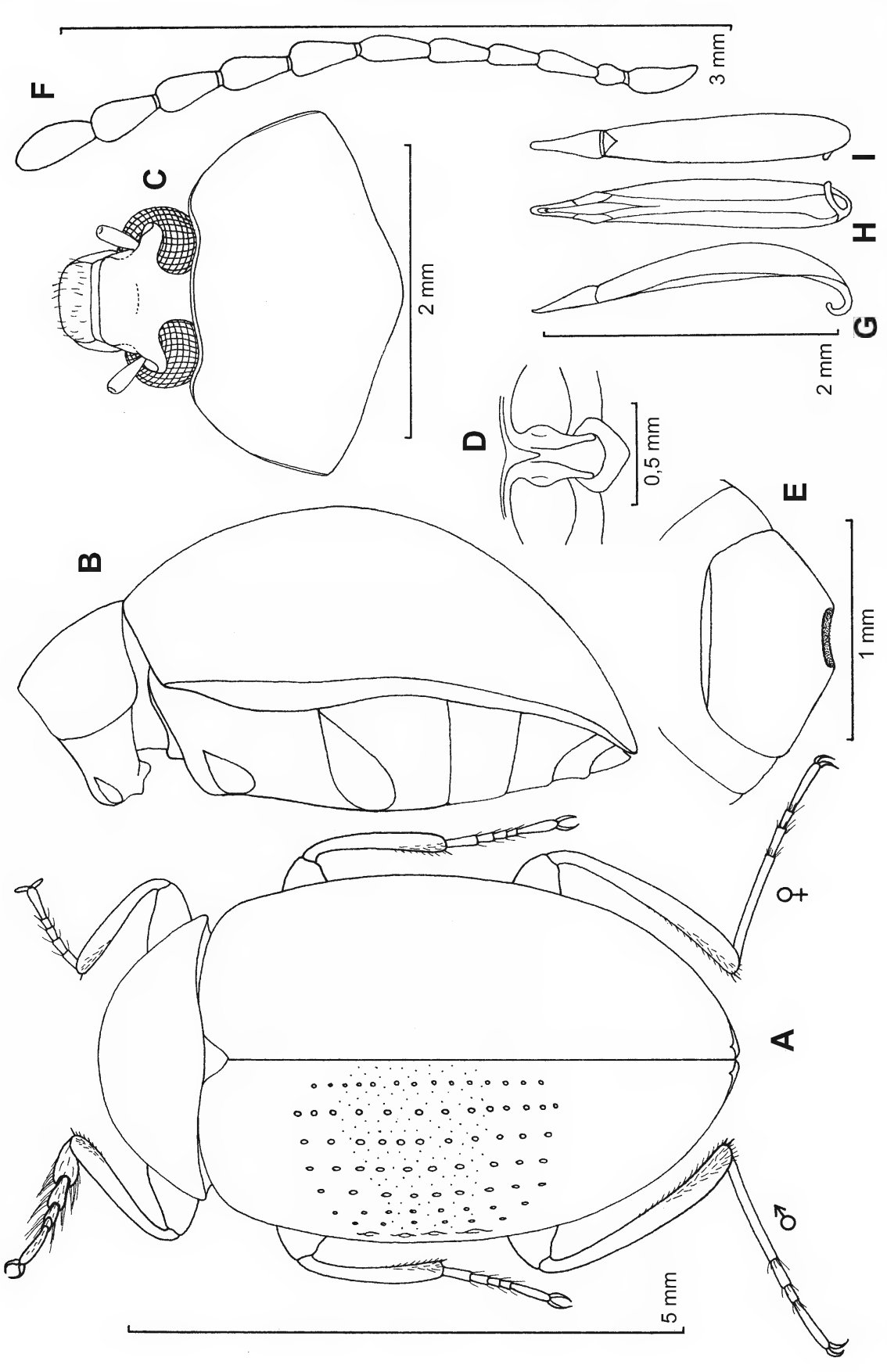


**Abb. 15.** *Amarygmus mindanaensis* n. sp. – **A** Habitus; linksseitig Beine ♂, rechtsseitig Beine ♀. **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Sternit 5, ♂. **F** Fühler. **G** Aedoeagus lateral. **H** Aedoeagus ventral. **I** Aedoeagus dorsal.

winklig. Oberseite mit weitläufig stehenden, feinen Punkten.

Scutellum: Dreieckig, mit etwas gebogenen Seiten, unpunktiert.

Flügeldecken: Länglich oval, quer stark gewölbt, längs deutlich gewölbt. Größte Breite und Höhe kurz vor der Mitte. Schulterbeulen etwas entwickelt. Enden der Flügeldecken gemeinsam verrundet. Seitenrandkanten nur in der Mitte sehr schmal sichtbar. Auf der Oberseite Punktreihen großer, meist runder, gelegentlich aber auch etwas länglicher Punkte, die auf der Scheibe in einigem Abstand voneinander stehen; in der 4. Reihe etwa 20 Punkte. Interstitien eben, mit winzigen, weitläufig stehenden Punkten.

Prosternum: Vorderrand seitlich schmal aufgebogen, median unterbrochen; median zieht eine flacher Kiel, vom Vorderrand ausgehend, in die Apophyse hinein. Apophyse ziemlich schmal; neben den Hüften die Seitenränder kurz etwas verbreitert und ventrad angehoben, dazwischen eine deutliche, breite Furche; hinter den Hüften horizontal vorgezogen, Seiten verbreitern sich leicht apikad; apikal sind sie zunächst etwas eingezogen (etwa von der Breite der Randungen der Seiten), median dann breit verrundet; hinter den Hüften findet sich median ein apikad zunehmend breiter werdender, niedriger Kiel.

Mesosternum: Hinterer Teil lang, schmal, vorne median ausgeschnitten.

Metasternum: Vorderrand zwischen den Mesocoxae schmal verrundet, gerandet. Vordere und hintere Querfurchen hinter den Mesocoxae bzw. vor den Metacoxae punktiert. Scheibe nahezu unpunktiert, median breit eingedrückt.

Sternite: Seiten der Apophyse des 1. Sternits laufen mit geraden Seiten spitzwinklig aufeinander zu, gerandet. Scheiben unpunktiert. Analsternit etwas angehoben und apikaler Rand median bei den ♂♂ etwas ausgeschnitten, seitlich davon mit einigen kleinen Punkten und (bei beiden Geschlechtern) mit Haaren. Intersegmentalmembran zwischen den Sterniten 3 und 4 bei den ♂♂ stark verbreitert, wodurch Sternit 3 sehr kurz wird.

Fühler: Mittellang, zurückgelegt etwa das erste Drittel der Flügeldecken überlappend. Antennomer 11 ziemlich lang, apikal mit einer asymmetrisch gelegenen Ecke. Die Längen und Breiten der Antennomeren 1–11 verhalten sich wie 16:6½ / 7:5 / 14:5 / 11:5 / 13:5½ / 13:6 / 14:7 / 15:7 / 15:7 / 15:7½ / 18:8.

Beine: Kurz. Femora zum zweiten Drittel hin stark keulenförmig verdickt. Pro- und Mesotibiae apikad etwas verdickt. Protibiae annähernd gerade, apikal außen leicht ausgeschnitten; innen apikal bei den ♂♂ mit einem kurzen Feld langer, etwas abstehender Haare. Mesotibiae außen sehr leicht gekrümmt, innen mit zwei Kanten und annähernd gerade; bei den ♂♂ apikal an der Innenseite mit einem kleinen Feld dicht und etwas abstehender, langer Haare. Metatibiae etwas gekrümmt, zunehmend in der apikalen Hälfte. Bei den ♂♂ sind die Protarsomeren 1–3 (in abnehmender Tendenz) sehr stark verbreitert (nicht so die Mesotarsomeren), außerdem stehen die Sohlenhaare der Protarsomeren seitlich ab. Protarsomeren der ♀♀ nicht verbreitert. Die Längen der Protarsomeren 1–5 bei einem ♂ sind 15:13:7:4:18, die der Mesotarsomeren 1–5 sind 12:8:7:4:19, die der Metatarsomeren 1–4 sind 41:13:7:20; die Längen der Protarsomeren 1–5 bei einem ♀ sind 10:8:5:4:19.

Aedoeagus: Siehe Abb. 15G-I.

## *Amarygmus negrosensis* **n. sp.**
(Abb. 16A–H)

Holotypus (♂): Philippines, Negros, X.1994, leg. L. Mohagan (TTM).

Paratypen: Gleiche Funddaten wie Holotypus (2 ♀♀ TTM, 1 ♀ ZSMB, 1 beschädigtes ♂ ZSMB). – Mt. Caula-on [= Mt. Canlaon], Negros, Philippines, IV.2006, D. Mohagan leg. (22 ♂♂, 20 ♀♀ CA, 3 ♂♂ ZSMB). – Gleiche Funddaten wie vorstehend, aber III.2006 (2 ♂♂, 2 ♀♀ CA, 2 ♂♂ ZSMB), IX.2006 (8 ♂♂, 5 ♀♀ CA, 4 ♂♂, 2 ♀♀ ZSMB) und I.2006 (2 ♂♂, 2 ♀♀ CA, 3 ♂♂, 1 ♀ ZSMB).

### Etymologie

Negrosensis, abgeleitet von Negros, der Insel der Philippinen, von der die Typenserie stammt.

### Diagnose

Geflügelt. Mittelgroße, ovale, etwas längliche, flache Art mit sehr schmaler Stirn. Flügeldecken mit punktierten Streifen und dicht punktierten Interstitien. Bei den ♂♂ Metasternum behaart und lange Haare an den Rückseiten der Meso- und Metafemora. Fühler dünn und ziemlich lang.

Nahe *A. spectabilis* (Gebien, 1921) und *A. planipennis* (Kulzer, 1951), die ebenfalls eine schmale Stirn und eine ähnliche Körperform aufweisen. Weil bei *A. negrosensis* die Oberseite einfarbig und die Stirn sehr schmal ist, ist diese Art besonders mit *A. spectabilis* zu vergleichen. *A. negrosensis* ist kleiner als *A. spectabilis* (Länge 11,9–12,3 mm), die Oberseite glänzt weniger, und die Seiten des Halsschildes verengen sich bei *A. negrosensis* stärker nach vorne. Auch *A. planipennis* ist größer als *A. negrosensis* (Länge 11,4–14,1 mm) und – im Gegensatz zu *A. negrosensis* – zweifarbig; weitere Unterschiede sind bei *A. planipennis* aufgeführt.

### Beschreibung

Maße: Länge 8,92–9,55 mm. Breite 4,94–5,25 mm. – Relationen: Breite/Länge des Halsschildes 1,84–1,90; Breite Hinterecken/Breite Vorderecken des Halsschildes 1,73–1,82. Länge/Breite der Flügeldecken 1,46–1,48; Länge Flügeldecken/Länge Halsschild 3,71–3,84; maximale

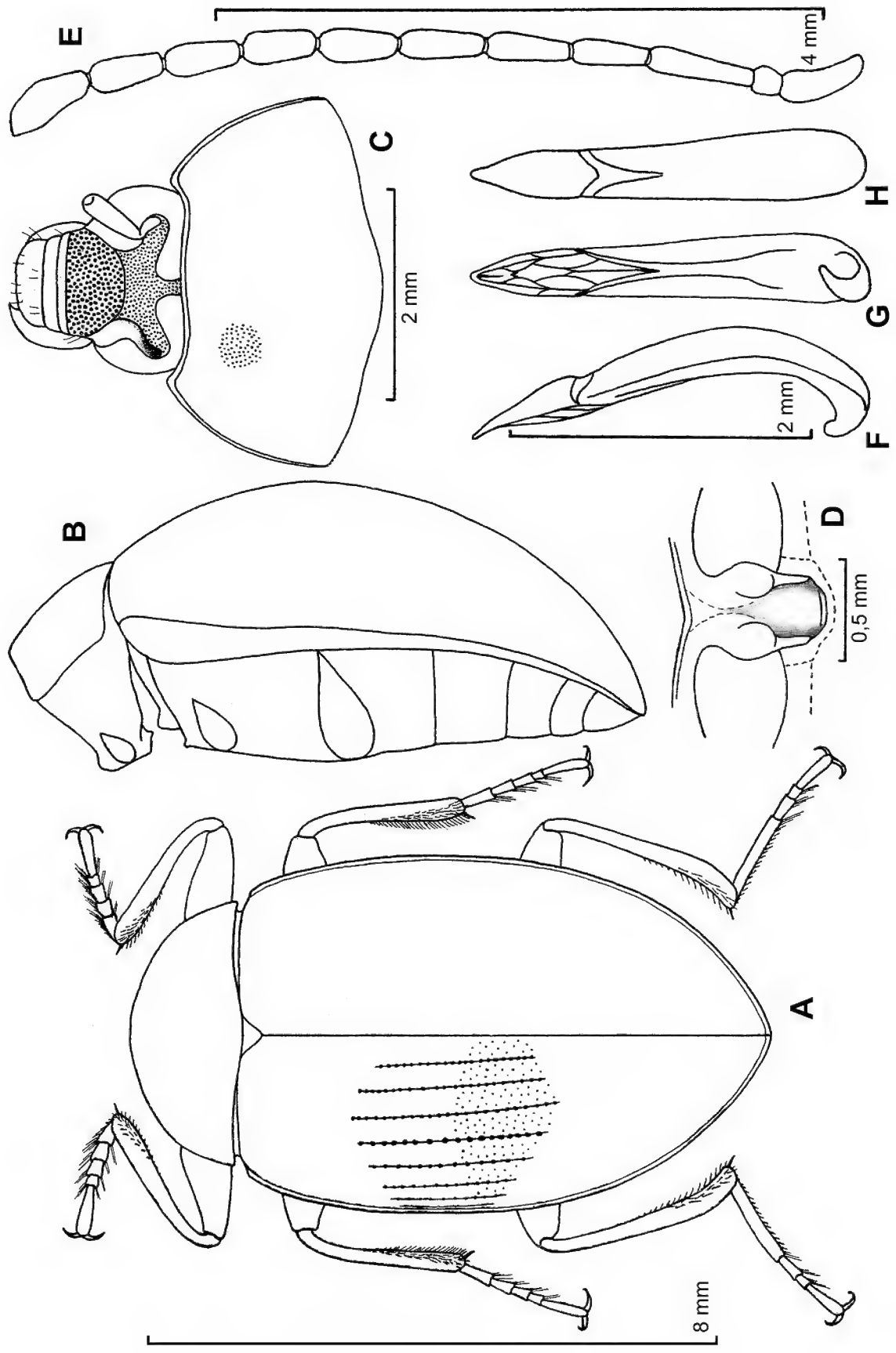


**Abb. 16.** *Amarygmus negrosensis* n. sp. – **A** Habitus, ♂. **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Fühler. **F** Aedoeagus lateral. **G** Aedoeagus ventral. **H** Aedoeagus dorsal.

Breite Flügeldecken/maximale Breite Halsschild 1,37–1,38.

Farbe: Halsschild und Flügeldecken bei Tageslicht mit mäßigem Glanz, kupfrig mit purpurnem Schimmer; unter der Mikroskopleuchte werden quere, regenbogenfarbige Reflexionen auf den Flügeldecken sichtbar. Kopf, Fühler und Beine schwarz. Unterseite schwarz.

Kopf: Stirn sehr schmal, etwa so breit wie zwei Ocellen; bei beiden Geschlechtern etwa gleich breit. Wangen nicht sehr breit, etwas gewölbt. Stirnnaht gering eingeschnitten und etwas eingedrückt, bogenförmig. Clypeus vorgezogen, quer und längs leicht gewölbt. Clypeus und Stirn klein, sehr dicht punktiert. Mentum herzförmig; die Mitte leicht gewölbt, mit einigen längeren, anliegenden Haaren. Unterseite des Halses mit dicht stehenden, mittelgroßen Punkten, die Ausgangspunkte kurzer, zarter, halb aufgerichteter Haare sind. Mandibeln außen gefurcht, apikal bifid.

Halsschild: Quer und längs nur gering gewölbt. Seitenränder verengen sich verrundet nach vorne. Vorderecken verrundet. Vorderrand etwas ausgeschnitten. Seitenränder und Vorderrand durchgehend gerandet. Bei Blick von oben sind die Randungen der Seiten sichtbar, vorne aber nur schmal. Bei Ansicht von der Seite sind die Vorderecken annähernd rechtwinklig, die Hinterecken stumpfwinklig. Oberseite mit feinen, ziemlich dicht stehenden Punkten.

Scutellum: Mit etwas gebogenen Seiten, fein punktiert.

Flügeldecken: Länglich oval, quer und längs nicht sehr stark gewölbt. Größte Breite und Höhe etwas vor der Mitte. Schultern entwickelt. Enden der Flügeldecken gemeinsam verrundet. Seitenrandkanten von oben in der gesamten Länge schmal sichtbar. Auf der Oberseite gering eingeschnittene Striae mit kleinen, dicht stehenden Punkten; in der 4. Stria etwa 44 Punkte. Interstitien gering gewölbt, sehr dicht, fein punktiert.

Prosternum: Vorderrand durchgehend aufgebogen, kaum zur Mitte hin eingezogen. Apophyse nahe dem Apex fast rechteckig, hinter den Hüften mit angehobenen, parallelen Seitenrändern; apikal abgeschnitten, mit ventrad angehobener Mitte; neben den Hüften etwas verbreitert und die Ränder deutlich angehoben, dazwischen zwischen den Hüften mit deutlicher, medianer Furche.

Mesosternum: Hinterer Teil breit, kurz, Vorderrand median breit ausgeschnitten.

Metasternum: Vorderrand zwischen den Mesocoxae breit verrundet und dick gerandet. Vorne sowie auf der Scheibe dicht, klein und eng punktiert, bei den ♂♂ mit zarten, aufgerichteten, etwas geneigten Haaren. Medianlinie in der hinteren Hälfte leicht eingeschnitten.

Sternite: Vorderrand des 1. Sternits zwischen den Metacoxae gerandet. Sternite 1 und 2 klein, dicht punktiert, mit winzigen Härchen. Sternite 3–5 sehr winzig punktiert. Analsternit auf der Scheibe bei den ♂♂ angedeutet abgeflacht.

Fühler: Dünn, bei beiden Geschlechtern etwa gleich lang, zurückgelegt nicht ganz die Mitte der Flügeldecken erreichend. Antennomer 11 asymmetrisch zugespitzt. Die Längen und Breiten der Antennomeren 1–11 verhalten sich wie 18:6 / 5:5 / 19:5 / 14:5 / 16:5 / 16:6 / 15:6½ / 14½: 6½ / 14:6½ / 14:6½ / 17:6½.

Beine: Femora leicht keulenförmig verdickt und bei den ♂♂ an den Rückseiten der Meso- und Metafemora in den basalen drei Fünftel mit einem Feld langer, zarter Haare, die in trockenem Zustand abstehen (bei älteren Tieren abgerieben). Protibiae basal etwas gekrümmt, dann außen annähernd gerade, innen bei beiden Geschlechtern in der apikalen Hälfte leicht keulenförmig verdickt. Mesotibiae annähernd gerade. Metatibiae in der basalen Hälfte gerade, in der apikalen Hälfte etwas nach innen gekrümmt. Protarsomeren 1–3 der ♂♂ nicht wesentlich verbreitert, aber auf der Sohlenfläche dicht, bürstenartig behaart. Die Längen der Protarsomeren 1–5 sind 6:6:6:4½:18, die der Mesotarsomeren 1–5 sind 13:8:6½:5:19, die der Metatarsomeren 1–4 sind 31:11:6:18.

Aedoeagus: Siehe Abb. 16F-H.

## *Amarygmus nigellus* **n. sp.**
(Abb. 17A–H)

Holotypus (♂): Mindanao, Davao Prov., 25 km NW New Bataan, 1200 m, 20.–22.V.1996, Bolm leg. (SMNS).

Paratypen: Gleiche Funddaten wie Holotypus (2 ♂♂, 2 ♀♀ SMNS). – Mindanao, 30 km E of Malaybalay, Busdi, 1000 m, 5.–9.V.1996, Bolm leg. (2 ♂♂ ZSMB, 2 ♀♀ SMNS). – Philippines, Leyte, Visca N Baybay, prim. forest, 200–500 m, 2.III.1991, leg. Schawaller et al. (1 ♂, 1 ♀ SMNS, 1 ♀ ZSMB). – Philippines, Leyte, Lake Danao, forest edge, 19.II.1991, leg. Schawaller et al. (1 ♀ SMNS). – Bislig, Surigao d. S., Mindanao, Philippines, 2.–7.VII.1977, Y. Kurosawa (1 ♀ CM).

### Etymologie

Nigellus (lat.) = schwärzlich.

### Diagnose

Geflügelt. Oben schwarz. Flügeldecken oval, stark gewölbt, mit feinen Striae, in denen die schmalen, kleinen Punkte kaum auffallen; Interstitien sehr gering gewölbt und winzig punktiert. Oberseite des Kopfes sehr dicht punktiert. Stirn mittelbreit. Fühler lang.

Gehört aufgrund der Körperform und des Sexualdimorphismus in die Nähe von *A. lugubris* n. sp. und *A. paradoxus* n. sp. Beide Arten besitzen aber im Gegensatz zu *A. nigellus* Punktreihen auf den Flügeldecken (und nicht Striae wie *A. nigellus*).

### Beschreibung

Maße: Länge 6,50–7,17 mm. Breite 3,94–4,22 mm.

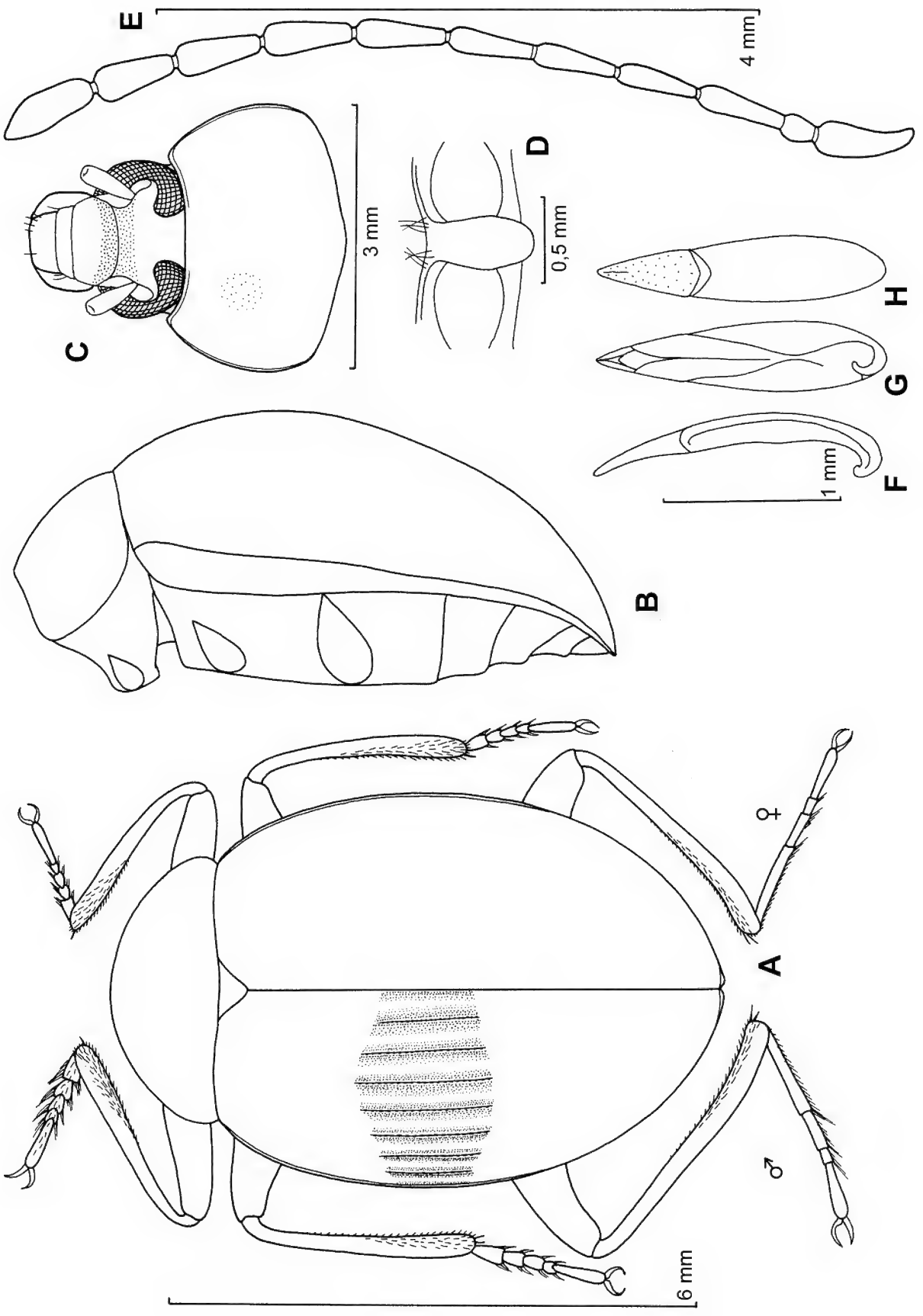


**Abb. 17.** *Amarygmus nigellus* n. sp. – **A** Habitus; linksseitig Beine ♂, rechtsseitig Beine ♀. **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Fühler. **F** Aedoeagus lateral. **G** Aedoeagus ventral. **H** Aedoeagus dorsal.

– Relationen: Breite/Länge des Halsschildes 1,62–1,75; Breite Hinterecken/Breite Vorderecken des Halsschildes 1,60–1,71. Länge/Breite der Flügeldecken 1,30–1,39; Länge Flügeldecken/Länge Halsschild 3,24–3,45; maximale Breite Flügeldecken/maximale Breite Halsschild 1,38–1,51.

Farbe: Oberseite schwarz, mit Metallschimmer. Beine schwarz, Tarsen braun. Fühler braun bis schwarz. Unterseite schwarzbraun, mit fettigem Glanz.

Kopf: Stirn mittelbreit, etwas schmaler als die Länge des 3. Antennomers (wie 13:15), ebenso wie Clypeus sehr dicht punktiert, Punkte klein. Wangen etwas aufgebogen, vorne vor der Stirnnaht endend. Stirnnaht durchgehend sehr fein eingeschnitten. Clypeus vorgezogen, längs leicht gewölbt. Mentum klein, apikad verbreitert, mit breiten, glänzenden Seitenrändern; median dazwischen groß, dicht punktiert und quer etwas gewölbt. Unterseite des Halses stark mikroretikuliert, in Querrichtung grob geriefelt und mit wenigen kleinen Punkten. Mandibeln außen gefurcht, apikal bifid.

Halsschild: Ziemlich schmal, flach, quer und längs leicht gewölbt. Bei den meisten Exemplaren Seiten leicht nach hinten eingezogen, dann größte Breite in der Mitte; bei anderen in der hinteren Hälfte subparallel, davor gebogen verengt. Vorderrand leicht ausgeschnitten. Seitenränder und Vorderrand durchgehend gerandet. Bei Blick von oben sind die Randungen der Seiten entweder in der ganzen Länge schmal sichtbar oder vorne nicht sichtbar. Bei Ansicht von der Seite sind die Vorderecken annähernd rechtwinklig, die Hinterecken stumpfwinklig. Oberseite mit feinen, nicht sehr dicht stehenden Punkten.

Scutellum: Dreieckig, mit einigen winzigen Punkten.

Flügeldecken: Länglich oval, quer und längs stark gewölbt. Größte Höhe und Breite in der Mitte. Schultern nur angedeutet. Enden der Flügeldecken gemeinsam verrundet. Seitenrandkanten von oben nicht sichtbar. Auf der Oberseite feine, leicht eingeschnittene Striae, in denen die sehr kleinen, schmalen Punkte nur als winzige Verbreiterungen der Striae erscheinen. Interstitien angedeutet konvex, mit winzigen, schütter stehenden Pünktchen.

Prosternum: Vorderrand seitlich schmal aufgebogen, in der Mitte unterbrochen. Apophyse schmal, ziemlich kurz; hinter den Hüften leicht herabgebogen; neben den Hüften nur wenig verbreitert und Seiten dort nicht ventrad aufgebogen; median an dieser Stelle nicht gefurcht; hinter den Hüften verengen sich die Seiten etwas; apikal verrundet; Oberseite mit flachen, großen Punkten und einigen langen, meist aufragenden Haaren.

Mesosternum: Hinterer Teil schmal, Vorderrand nicht ausgeschnitten; insgesamt flach, dicht punktiert, mit einigen langen, ungerichteten Haaren bei beiden Geschlechtern.

Metasternum: Quer deutlich gewölbt. Vorderrand zwischen den Mesocoxae schmal verrundet, gerandet. Bei beiden Geschlechtern Scheibe dicht, klein bis fein punktiert, mit ungerichteten, meist etwas geneigten, langen Haaren. Medianlinie in der hinteren Hälfte etwas eingedrückt. Laterale Teile mit flachen, mittelgroßen Punkten.

Sternite: Vorderrand des 1. Sternits zwischen den Metacoxae spitzbogig, schmal gerandet. Scheiben der Sternite 1–3 dicht, klein punktiert, mit mittellangen, ungerichteten Haaren. Sternite 4 und 5 ebenfalls dicht punktiert, Punkte aber kleiner und Haare kürzer, meist anliegend. Sternit 5 der ♂♂ ohne strukturelle Besonderheiten.

Fühler: Lang, bei beiden Geschlechtern annähernd gleich lang, zurückgelegt die Flügeldecken etwa bis zur Mitte überlappend. Antennomer 11 apikal asymmetrisch zugespitzt. Die Längen und Breiten der Antennomeren 1–11 verhalten sich wie 16:6 / 5:4½ / 15:4½ / 13:4½ / 15:4½ / 14:4½ / 15:5½ / 14:6 / 13:6 / 12:6 / 16:6.

Beine: Ziemlich lang und schmal. Femora kompress, zum zweiten Drittel hin nicht sehr stark keulenförmig verdickt. Pro- und Mesotibiae annähernd gerade, bei den ♂♂ an den Innenseite apikal mit einem kleinen, nicht sehr auffallenden Feld dicht stehender, kurzer Haare. Metatibiae in der basalen Hälfte annähernd gerade, dann apikad leicht nach innen gekrümmt. Tarsomeren kurz. Protarsomeren 1–3 bei den ♂♂ leicht verbreitert. Die Längen der Protarsomeren 1–5 bei einem ♂ sind 6:6:4:3:15, die der Mesotarsomeren 1–5 sind 8:5:4:4:15, die der Metatarsomeren 1–4 sind 20:11:4:15.

Aedoeagus: Siehe Abb. 17F-H.

### *Amarygmus notabilis* **n. sp.**
(Abb. 18A–H)

Holotypus (♂): Philippines, N Luzon, Kalinga-AP/Abra Pr. boundary, Cordillera Centr., around Pass at 1600 ± 100 m, 17°30'N 121°00'E, 26.–28.III.2000, L. Dembický leg. (SMNS).

Paratypen: Gleiche Funddaten wie Holotypus (1 ♂ SMNS, 1 ♂ ZSMB; bei beiden Exemplaren Fühler defekt).

#### Etymologie

Notabilis (lat.) = bemerkenswert.

#### Diagnose

Geflügelt. Langgestreckte, quer stark gewölbte Art mit sehr stark gewölbten Interstitien der Flügeldecken und sehr deutlichen, farbigen Längsstreifen. Stirn ziemlich breit. Fühler nicht sehr lang, aber gut gegliedert. Protarsomeren bei den ♂♂ leicht verbreitert; Mesotibiae im basalen Drittel verrundet abgeknickt.

Gehört zu den langgestreckten Arten. *A. elytralis* Bremer, 2001 mit gewölbten Interstitien und farbigen Längsstreifen ist ähnlich, ist aber wesentlich größer (Körperlänge ca. 11 mm) als *A. notabilis*, die Stirn ist schmaler und die Protarsomeren 1–3 der ♂♂ sind wesentlich breiter.

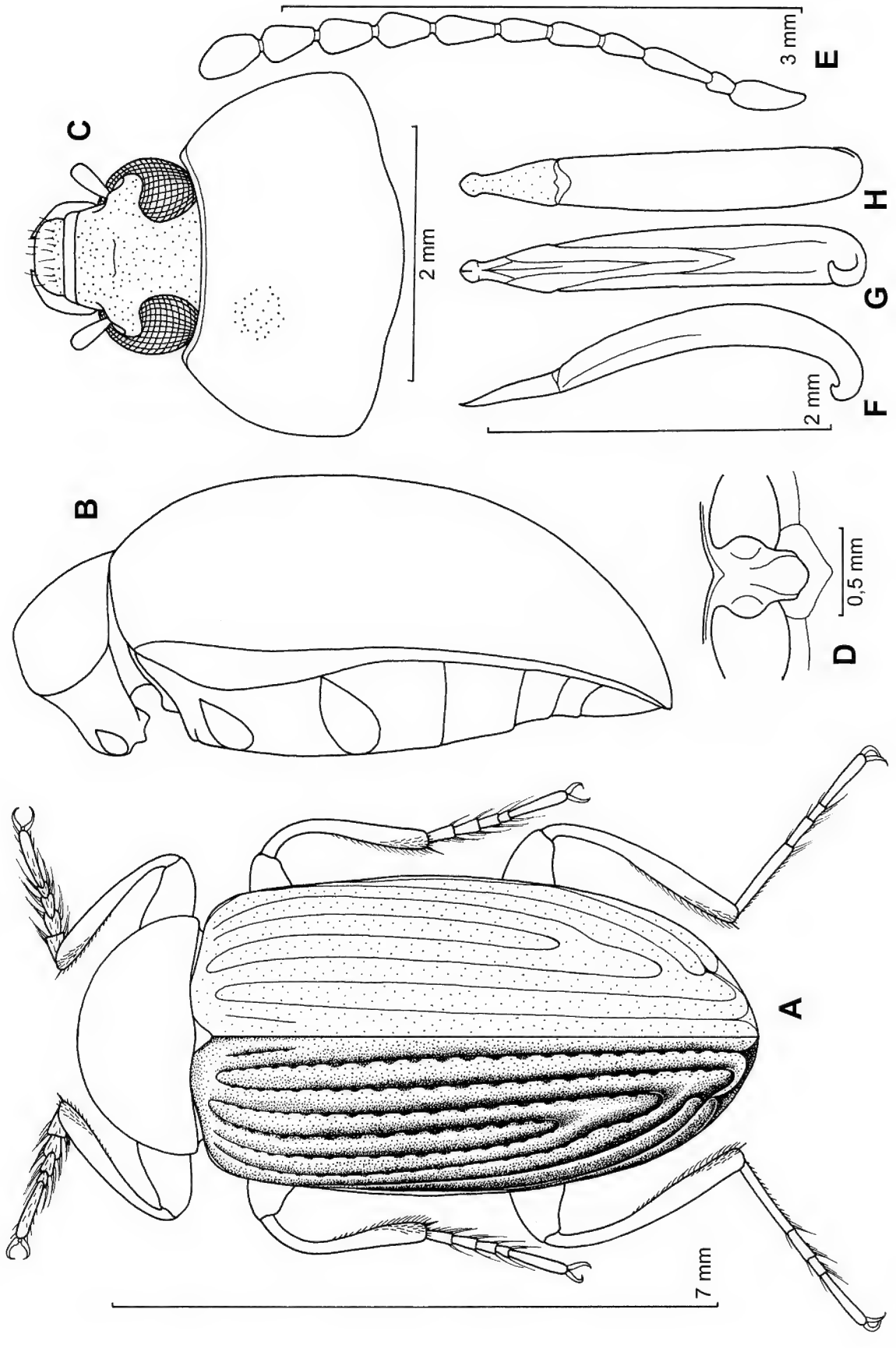


**Abb. 18.** *Amarygmus notabilis* n. sp. – **A** Habitus, ♂. **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Fühler. **F** Aedoeagus lateral. **G** Aedoeagus ventral. **H** Aedoeagus dorsal.

## Beschreibung

M a ß e : Länge 7,17–7,32 mm. Breite 3,62–3,66 mm. – Relationen: Breite/Länge des Halsschildes 1,74–1,79; Breite Hinterecken/Breite Vorderecken des Halsschildes 1,62–1,74. Länge/Breite der Flügeldecken 1,65–1,69; Länge Flügeldecken/Länge Halsschild 3,95–4,00; maximale Breite Flügeldecken/maximale Breite Halsschild 1,34–1,35.

F a r b e : Kopf, Halsschild, Unterseite und Beine schwarz. Flügeldecken mit stark farbigen, abwechselnd grün und purpurfarbenen (teilweise auch leicht goldenen) Längsstreifen; die Streifen entsprechen in der Breite meistens einem Interstitium, wobei die Farben im vorderen Teil der Flügeldecken auch schräg einwärts ziehen können. Flügeldecken etwas mikroretikuliert und dadurch nicht sehr stark glänzend.

K o p f : Stirn ziemlich breit, etwa so breit wie die Länge des 3. Antennomers, flach. Wangen etwas gewölbt, seitlich den medianen Teil der Stirnnaht kraniad überlappend. Stirnnaht nur median sehr schwach eingeschnitten und leicht breit eingedrückt. Clypeus, bezogen auf das vordere Ende der Wangen, nur kurz vorgezogen, ziemlich flach und nur seitlich gering herabgebogen, mit feinen, wenig markanten Punkten. Stirn ähnlich wie Clypeus punktiert. Mentum halbkreisförmig, Seitenränder und Hinterrand eben, breit, glänzend; dazwischen median etwas matter, quer leicht gewölbt. Unterseite des Halses stark mikroretikuliert, vorne mit kleinen, flachen, eng stehenden Punkten. Mandibeln außen gefurcht, apikal bifid.

H a l s s c h i l d : Nicht sehr breit. Quer deutlich, längs leicht gewölbt. Seiten in der hinteren Hälfte subparallel, nach vorne dann etwas verrundet verengt. Vorderecken von oben betrachtet verrundet. Vorderrand leicht ausgeschnitten. Seitenränder und Vorderrand durchgehend gerandet. Die Randungen der Seiten sind von oben nur in der hinteren Hälfte sehr schmal sichtbar. Bei Ansicht von der Seite sind die Vorderecken schmal verrundet, annähernd rechtwinklig, die eckigen Hinterecken stumpfwinklig. Oberseite mit kleinen, nicht sehr dicht stehenden Punkten.

S c u t e l l u m : Dreieckig, mit einigen winzigen Punkten.

F l ü g e l d e c k e n : Langgestreckt, mit subparallelen Seiten bis zum Beginn des hinteren Drittels. Quer und längs deutlich gewölbt. Größte Höhe etwas vor der Mitte. Schultern deutlich entwickelt. Enden der Flügeldecken gemeinsam verrundet. Seitenrandkanten von oben hinter den Schultern bis kurz vor dem Apex sichtbar, wo sie durch die ersten und zweiten Interstitien wulstartig überwölbt werden. Auf der Oberseite sehr stark eingeschnittene Striae; in ihnen große, längliche, kaum kerbende Punkte; Stria 4 kurz, verbindet sich am Beginn des hinteren Drittels mit Stria 5, 3 verbindet sich dahinter mit 6, 7 verbindet sich nahe dem Apex mit 8, 1 und 2 münden seitlich in den Seitenrandstreifen. Interstitien sehr stark, fast wulstartig gewölbt; 3. und 6. Interstitium vereinen sich hinten zu einem gemeinsamen Interstitium, dieses gemeinsame Interstitium verbindet sich weiter hinten mit dem 8. Interstitium; das 2. Interstitium biegt kurz vor dem Apex zur Seite um und endet frei; Interstitien mit feinen, deutlichen, nicht sehr dicht stehenden Punkten.

P r o s t e r n u m : Vorderrand schmal aufgebogen, median etwas zur Apophyse hin eingezogen. Apophyse neben den Hüften etwas verbreitert, Ränder dort ventrad angehoben, so dass zwischen ihnen median eine mittelbreite, tiefe Furche entsteht; hinter den Hüften etwas vorgezogen, mit subparallelen, etwas erhabenen Rändern; mediad dieser Ränder etwas eingedrückt, so dass die Mitte dazwischen leicht kielartig angehoben ist; apikal breit verrundet.

M e s o s t e r n u m : Vorderrand des hinteren Teils median nicht sehr tief ausgeschnitten, Ränder des Ausschnitts schmal angehoben Hinten, kurz vor dem basalen Rand, beiderseits stichelartige Eindrücke.

M e t a s t e r n u m : Vorderrand zwischen den Mesocoxae dick gerandet. Vorderer Teil mit kleinen, wenig auffallenden Punkten, hintere drei Viertel mit winzigen, schütter stehenden Punkten. Medianlinie von hinten bis zur Mitte leicht eingedrückt.

S t e r n i t e : Apophyse des 1. Sternits gegenüber dem dahinter liegenden Teil des 1. Sternits, der etwas gewölbt ist, eingedrückt; auch Sternit 2 längs etwas gewölbt. Sternite 1+2 mit kleinen, dicht stehenden Punkten. Sternite 3–5 mit feinen Punkten. Sternit 5 der ♂♂ ohne strukturelle Besonderheiten.

F ü h l e r : Ziemlich kurz, zurückgelegt etwa das erste Viertel der Flügeldecken überlappend. Antennomeren 7–11 gut gegliedert, 7–10 apikad an Dicke zunehmend. Antennomer 11 apikal asymmetrisch verrundet. Die Längen und Breiten der Antennomeren 1–11 verhalten sich wie 14:8 / 8:7 / 29:6 / 12:6 / 14:6½ / 13:6½ / 18:8 / 17:9 / 16:9 / 15:9 / 19:11.

B e i n e : Kurz. Femora zum zweiten Drittel hin kompress und deutlich keulenförmig verdickt. Protibiae apikad verdickt, an der Außenseite angedeutet konkav; apikal an der Innenseite bei den ♂♂ ohne Haarfeld. Mesotibiae (wahrscheinlich nur bei den ♂♂) im basalen Drittel stark gekrümmt, an der Innenseite apikal mit Borsten, aber bei den ♂♂ ohne apikales Haarfeld. Metatibiae insgesamt leicht gekrümmt. Protarsomeren 1–3 etwas verbreitert (sicher nur bei den ♂♂). Die Längen der Protarsomeren 1–5 sind 10:10:8:7:33, die der Mesotarsomeren 1–5 sind 15:13:10:9:36, die der Metatarsomeren 1–4 sind 45:18:11:39.

A e d o e a g u s : Siehe Abb. 18F-H.

### *Amarygmus oeneus* **n. sp.**
(Abb. 19A–H)

Holotypus (♂): Philippines, N Luzon, Ilocos Norte Pr., Patapat Mts., N of Adams, 300 m, 18°30'N 120°55'E, 3.IV.2000, L. Dembický leg. (SMNS).

#### Etymologie

Oeneus = Οἰνεύς, Name aus der griechischen Mythologie.

#### Diagnose

Klein, kompakt, oval. Fühler lang und dünn. Beim ♂ Protarsomeren 1–3 verbreitert und mit einem Ausschnitt an der Innenseite der Mesotibiae. Flügeldecken mit punktierten Striae und ebenen, fein punktierten Interstitien. Flügeldecken an den Seiten grünlich, medial über dunkelblau bis dunkel purpurfarben wechselnd. Halsschild schwarz. Beine und Fühler braun.

Die Gestalt erinnert an *Alphitobius diaperinus* (Panzer, 1797), jedoch handelt es sich eindeutig um eine Art der Gattung *Amarygmus*. Unter den *Amarygmus*-Arten kenne ich keine vergleichbare Form.

#### Beschreibung

Maße: Länge 5,25 mm. Breite 3,04 mm. – Relationen: Breite/Länge des Halsschildes 1,98; Breite Hinterecken/Breite Vorderecken des Halsschildes 1,80. Länge/Breite der Flügeldecken 1,38; Länge Flügeldecken/Länge Halsschild 3,60; maximale Breite Flügeldecken/maximale Breite Halsschild 1,31.

Farbe: Oberseite leicht glänzend. Kopf und Halsschild schwarz. Die Flügeldecken weisen einen Farbwechsel von lateral nach medial von grün über blau nach dunkelviolett auf (besonders im hinteren Teil bei Ansicht von hinten sichtbar). Femora dunkelbraun, Tibiae braun, Tarsen hellbraun. Fühler hellbraun. Unterseite dunkelbraun. Metasternum glänzend, Sternite matt.

Kopf: Stirn nicht sehr breit, die Breite entspricht etwa der Länge des 4. Antennomers. Wangen etwas über den mittleren Teil der Stirnnaht nach vorne reichend, leicht aufgebogen. Stirnnaht breit median eingedrückt und etwas eingeschnitten. Clypeus vorgezogen, quer und längs etwas gewölbt. Clypeus und Stirn mit feinen, schütter stehenden Punkten; aus den Punkten des Clypeus entspringen winzige Härchen. Mentum umgekehrt trapezförmig, Vorderecken etwas verrundet, mit breiten, flachen, glänzenden Seitenrändern; dazwischen quer gewölbt. Unterseite des Halses mit sehr dicht stehenden, großen Punkten. Mandibeln außen gefurcht, apikal bifid.

Halsschild: Breit, relativ kurz. Quer und längs gleichmäßig gewölbt. Seiten verschmälern sich gebogen nach vorne. Vorderecken verrundet. Vorderrand leicht ausgeschnitten. Seiten und Vorderrand durchgehend gerandet. Bei Aufsicht sind die Randungen der Seiten in der gesamten Länge gut sichtbar. Bei Ansicht von der Seite sind Vorder- und Hinterecken stumpfwinklig, Vorderecken verrundet, Hinterecken eckig. Oberseite mit feinen, nicht sehr dicht stehenden Punkten.

Scutellum: Dreieckig, mit einigen feinen Punkten.

Flügeldecken: Leicht länglich oval, ziemlich breit, quer und längs nicht sehr stark gewölbt. Größte Breite und Höhe etwa in der Mitte. Schulterbeulen angedeutet. Enden der Flügeldecken gemeinsam verrundet. Seitenrandkanten in der gesamten Länge von oben relativ breit sichtbar. Auf der Oberseite etwas eingeschnittene Striae mit mittelgroßen Punkten, deren Abstände auf der Scheibe etwa den Punktdurchmessern entsprechen; in der 4. Stria etwa 34 Punkte. Interstitien auf der Scheibe leicht gewölbt, seitlich etwas stärker gewölbt, fein und nicht sehr dicht punktiert.

Prosternum: Vorderrand schmal aufgebogen, median mit einer kleinen Ausziehung in Richtung Apophyse. Apophyse median zwischen den Hüften sehr tief gefurcht, dort sind die Seiten etwas verbreitert und deutlich ventrad angehoben; hinter den Hüften etwas kaudad vorgezogen, mit leicht sich verschmälernden Seiten; apikal verrundet.

Mesosternum: Vorderrand des hinteren Teils fällt senkrecht zum herabgedrückten vorderen Teil ab, median deutlich ausgeschnitten, seitlich des Ausschnitts konusartig angehoben.

Metasternum: Vorderrand zwischen den Mesocoxae schmal verrundet, dick gerandet. Vorne mit einigen verwaschenen, kleinen Punkten. Mediane Sutur schwach eingeschnitten.

Sternite: Vorderrand des 1. Sternits zwischen den Metacoxae spitzbogig, schmal gerandet. Sternite mit einigen längsstrichigen Strukturen, unpunktiert. Sternit 5 apikomedian leicht eingedrückt (sicher nur beim ♂).

Fühler: Lang, dünn, zurückgelegt etwas über die Mitte die Flügeldecken überlappend. Die Längen und Breiten der Antennomeren 1–11 verhalten sich wie 15:6 / 6:4½ / 17:4½ / 12:4½ / 14:5 / 13:5 / 15:6 / 15:6½ / 15:7 / 15:7 / 19:7½.

Beine: Kurz. Femora zum zweiten Drittel hin keulenförmig verdickt. Protibiae apikad etwas verdickt, außen gerade, innen angedeutet wellenförmig. Mesotibiae apikad leicht verdickt, außen leicht gekrümmt, innen in der apikalen Hälfte mit einer scharfen Kante, die bei etwa drei Viertel basal von einem scharf begrenzten kleinen Ausschnitt unterbrochen wird. Metatibiae gerade. Protarsomeren 1–3 beim ♂ etwas verbreitert und auf der Unterseite dicht bürstenartig behaart. Die Längen der Protarsomeren 1–5 sind 8:6:6:5:17, die der Mesotarsomeren 1–5 sind 9:8:7:5½:18, die der Metatarsomeren 1–4 sind 30:11:6:18.

Aedoeagus: Siehe Abb. 19F-H.

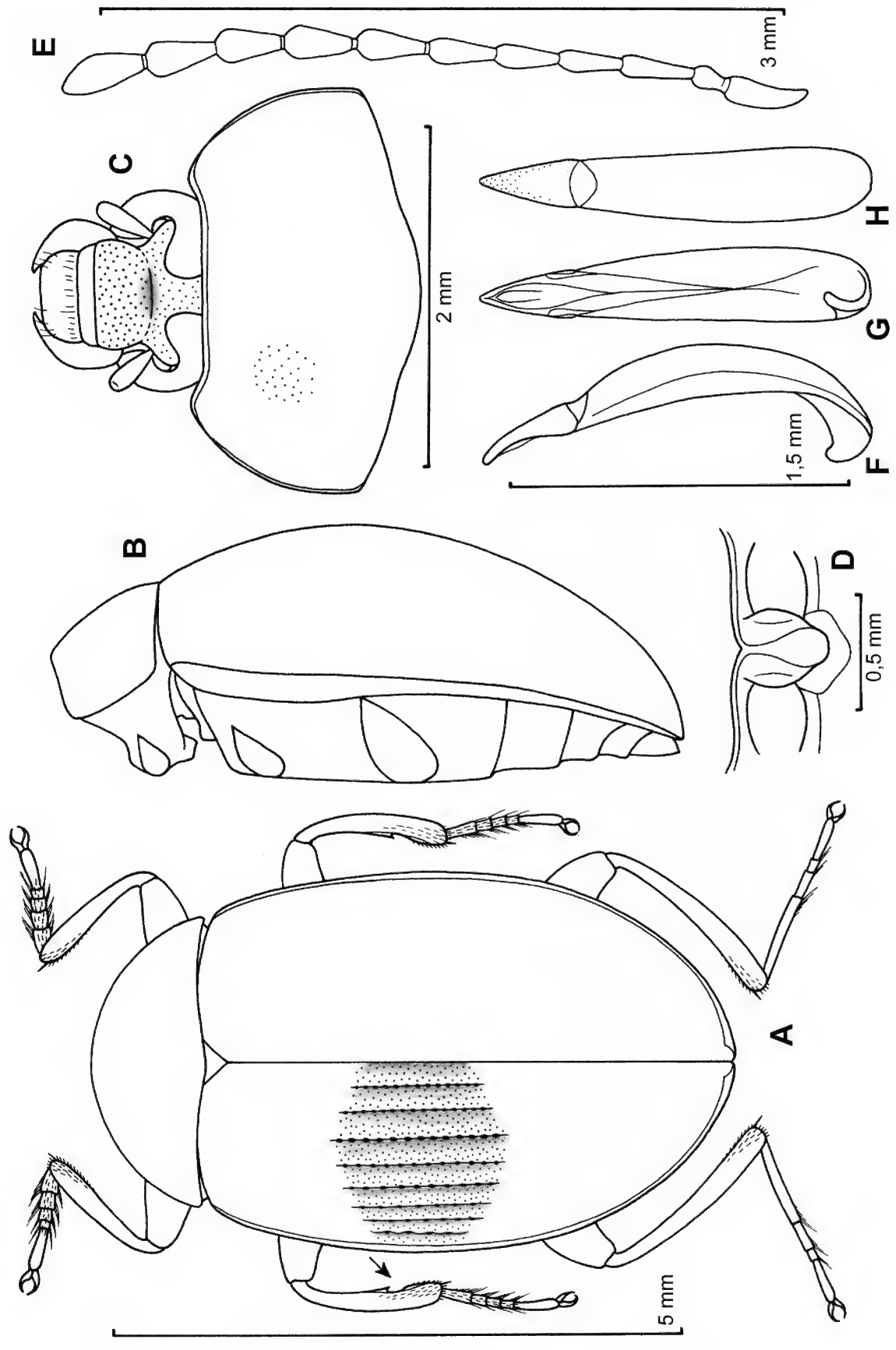


**Abb. 19.** *Amarygmus oeneus* n. sp. – **A** Habitus, ♂ (der Pfeil zeigt den kleinen Ausschnitt an der Mesotibia). **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Fühler. **F** Aedoeagus lateral. **G** Aedoeagus ventral. **H** Aedoeagus dorsal.

### *Amarygmus palawanensis* **n. sp.**
(Abb. 20A–E)

Holotypus (♀): Philipp., Palawan, Salakat mt., 800 m, 9°51'N 118°23'E, 10.–27.II.2000, leg. GORBACHEV & SINIAEV (SSB).

Paratypen: Gleiche Funddaten wie Holotypus (1 ♀ SSB, 1 ♀ ZSMB).

Etymologie

Palawanensis, nach dem Fundort, der Insel Palawan.

Diagnose

Klein, oval, farbig, mit Reflexionen in den Spektralfarben und farbig unterschiedlich irisierenden Längsstreifen auf den Flügeldecken. Flügeldecken mit Punktreihen und flachen, dicht punktierten Interstitien. Halsschild breit. Stirn mittelbreit. Fühler ziemlich kurz.

*A. palawanensis* n. sp. besitzt eine große Ähnlichkeit mit *A. steatitis* Bremer, 2005, der auf der Malayischen Halbinsel und auf Sumatra vorkommt. *A. steatitis* besitzt dieselbe Größe, Gestalt, Breite der Stirn, Länge der Fühler und Form der Beine. Bei *A. steatitis* findet sich außerdem eine ähnlich dichte Punktierung der Interstitien der Flügeldecken. Die Punkte der Punktreihen der Flügeldecken stehen jedoch bei *A. steatitis* weiter voneinander entfernt und sind größer als bei *A. palawanensis*, außerdem fehlen *A. steatitis* die farbigen Längsstreifen auf den Flügeldecken, die *A. palawanensis* besitzt.

Unter den philippinischen Arten steht *A. palawanensis* besonders *A. ambitiosus* n. sp. nahe; bezüglich der Unterschiede siehe bei *A. ambitiosus*.

Beschreibung

Maße: Länge 6,01–6,45 mm. Breite 3,90–4,22 mm. – Relationen: Breite/Länge des Halsschildes 2,13–2,31; Breite Hinterecken/Breite Vorderecken des Halsschildes 1,84–1,95. Länge/Breite der Flügeldecken 1,31–1,40; Länge Flügeldecken/Länge Halsschild 3,74–4,00; maximale Breite Flügeldecken/maximale Breite Halsschild 1,31–1,33.

Farbe: Stark farbig, leicht glänzend. Bei wechselnden Winkeln des Lichteinfalls wechselnde Farben, wobei sich auf den Flügeldecken bei querem Lichteinfall die Spektralfarben in Längsstreifen ordnen, bei Lichteinfall von schräg vorne ändern sich die Farben in den Streifen aber ebenfalls. Der Halsschild weist ebenfalls farbige Reflexionen auf, wobei der mittlere Bereich meist grünlich, die seitlichen Bereiche meist purpurfarben reflektieren. Stirn grün. Clypeus, Beine und Fühler schwarzbraun. Unterseite schwarzbraun.

Kopf: Stirn mittelbreit, etwas breiter als die Länge des 3. Antennomers (wie 19:15). Wangen ziemlich schmal, deutlich weiter kraniad reichend als der mittlere Bereich der Stirnnaht, gering gewölbt. Stirnnaht median eingedrückt, leicht eingeschnitten. Clypeus, bezogen auf den Vorderrand der Wangen, gering vorgezogen, bezogen auf den mittleren Bereich der Stirnnaht mittelweit vorgezogen, längs und quer etwas gewölbt. Clypeus und Stirn ziemlich dicht und klein punktiert. Mentum insgesamt glänzend, apikad verbreitert, mit leicht gebogenen Seitenrändern; median deutlich gewölbt. Mandibeln außen gefurcht, apikal bifid.

Halsschild: Quer deutlich gewölbt, längs etwas weniger gewölbt. Die Seiten verengen sich gebogen nach vorne. Vorderecken verrundet. Vorderrand etwas ausgeschnitten. Seitenränder und Vorderrand durchgehend gerandet. Bei Aufsicht sind die Randungen der Seiten, mit Ausnahme des Bezirks kurz hinter den Vorderecken, gut sichtbar. Bei Ansicht von der Seite sind die Vorderecken verrundet, die Hinterecken eckig, beide stumpfwinklig. Oberseite mit kleinen, unregelmäßig, aber meist dicht stehenden, deutlichen Punkten.

Scutellum: Dreieckig, fast unpunktiert.

Flügeldecken: Leicht länglich oval, quer und längs stark gewölbt. Größte Breite und Höhe kurz vor oder in der Mitte. Schulterbeulen angedeutet. Enden der Flügeldecken gemeinsam verrundet. Seitenrandkanten von oben in nahezu der gesamten Länge sehr schmal sichtbar. Auf der Oberseite Punktreihen mittelgroßer, deutlicher Punkte, die in den ersten drei Reihen etwas enger als in den folgenden Reihen stehen; in der 4. Reihe etwa 23 Punkte, Abstand der Punkte voneinander etwa das 2- bis 3-fache der Punktdurchmesser. Interstitien flach; dicht, fein und deutlich punktiert.

Prosternum: Vorderrand schmal aufgebogen, median zur Apophyse hin eingezogen und dort mit einem kurzen, spitzen Fortsatz in Richtung Apophyse. Apophyse oval, kaudad horizontal vorgezogen, Seitenränder leicht angehoben, zwischen den Hüften median etwas gefurcht; apikomedian leicht angehoben.

Mesosternum: Hinterteil mit unebener Oberfläche, median vorne deutlich ausgeschnitten, seitliche Ränder gegenüber der Mitte ventrad angehoben.

Metasternum: Vorderrand zwischen den Mesocoxae verrundet, gerandet. Vordere Bezirke mit undeutlichen, kleinen, nicht sehr dicht stehenden Punkten, hintere Bezirke mit feinen Punkten. Mediane Sutur sehr leicht eingeschnitten.

Sternite: Vorderrand des 1. Sternits zwischen den Metacoxae spitzbogig, gerandet. Die vorderen drei Sternite mit undeutlichen, kleinen Punkten. Die hinteren zwei Sternite wesentlich kleiner punktiert.

Fühler: Kurz, zurückgelegt beim ♀ (♂ unbekannt) etwa ein Fünftel der Flügeldecken überlappend. Die Längen und Breiten der Antennomeren 1–11 verhalten sich wie 12:7 / 7:5½ / 15:5½ / 9:5½ / 9:6 / 10:7½ / 11:8 / 13:9 / 13:9 / 12½:9 / 16:9.

Beine: Kurz. Profemora zum zweiten Drittel hin

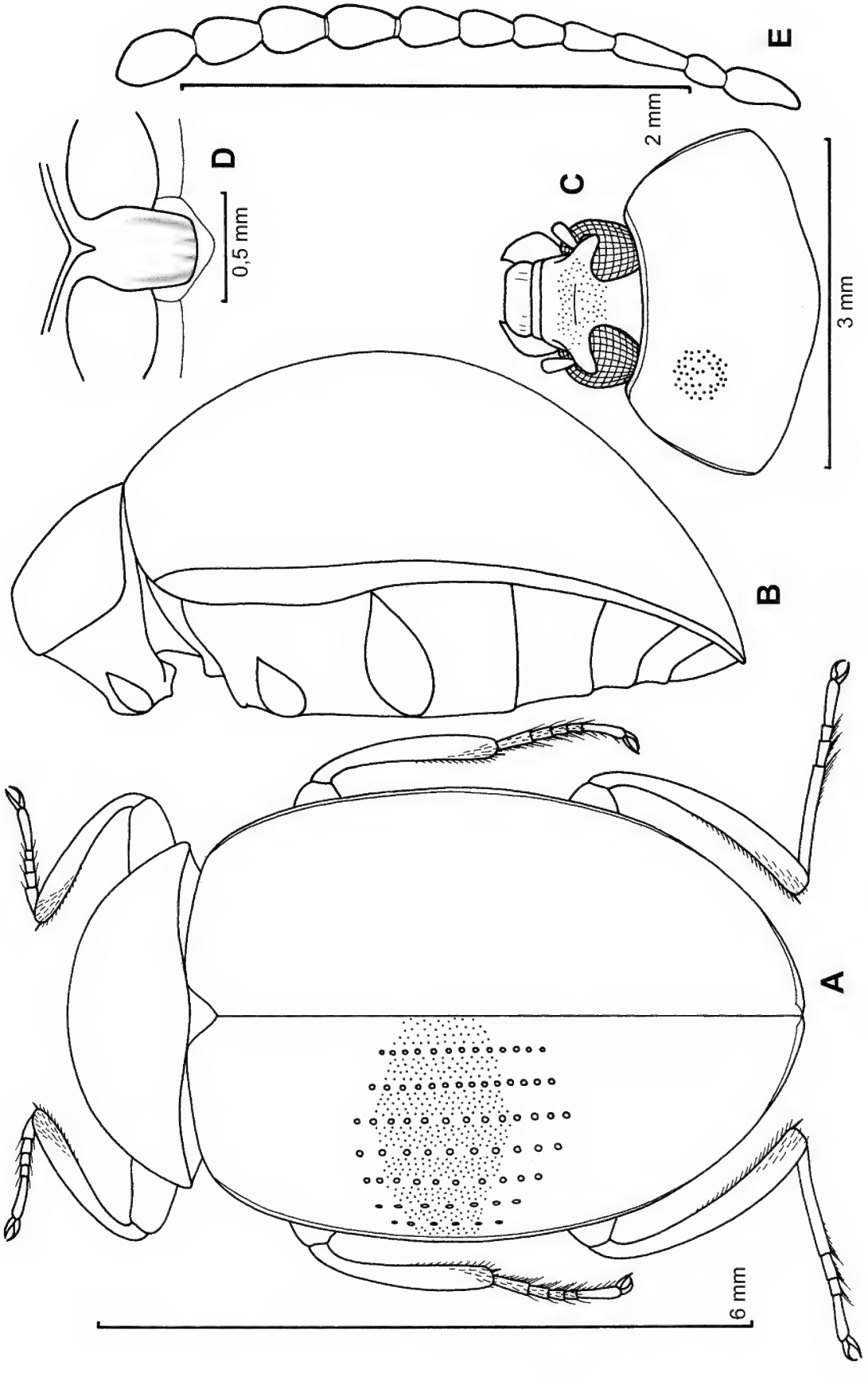


**Abb. 20.** *Amarygmus palawanensis* n. sp. – **A** Habitus, ♀. **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Fühler.

deutlich keulenförmig verdickt. Protibiae annähernd gerade. Mesotibiae leicht gekrümmt. Metatibiae deutlich gekrümmt. Die Längen der Protarsomeren 1–5 sind 8:7:6:6:20, die der Mesotarsomeren 1–5 sind 14:7:6:5:21, die der Metatarsomeren 1–4 sind 42:11:9:22.

### *Amarygmus paradoxus* **n. sp.**
(Abb. 21A–I)

Holotypus (♂): Philippines, N Luzon, Kalinga-AP/Abra Pr. boundary, Cordillera Centr., around Pass at 1600 ± 100 m, 17°30'N 121°00'E, 26.–28.III.2000, L. Dembický leg. (SMNS).

Paratypen: Gleiche Funddaten wie Holotypus (1 ♀ SMNS). – Philippines, N Luzon, Mountain Prov., Bontoc region, NW of Barlig, 2000 m, 17°03'N 121°04'E, 9.IV.2000, L. Dembický leg. (1 ♂ ZSMB, 1 ♀ SMNS). – Philippinen, Luzon, Provinz Ifugao, Mt. Polis, 20 km N Banaue, 1600 m, 26.VII.1993, LF, leg. Mario Graul, ex coll. M. Hoffmann (1 ♂ CL). – Philippines, North Luzon, Mt. Polis, VI.2006 (1 ♂ CA).

#### Etymologie

Paradoxus (lat.) = seltsam, wunderbar.

#### Diagnose

Geflügelt. Flügeldecken in der Mitte subparallel, mit Punktreihen sehr großer Punkte. Halsschild wenig gewölbt. Fühler nicht sehr lang, aber sehr dünn. Flügeldecken dunkelgrün. Beine und Fühler rotbraun. Unterseite kahl. Protarsomeren 1–3 der ♂♂ etwas verbreitert.

Gehört aufgrund der Gestalt und des Sexualdimorphismus in die Nähe von *A. lugubris* n. sp. und *A. nigellus* n. sp. Die Punkte der Punktreihen auf den Flügeldecken sind bei *A. lugubris* im Gegensatz zu denen von *A. paradoxus* sehr zart und klein. *A. nigellus* besitzt im Gegensatz zu *A. paradoxus* auf den Flügeldecken keine Punktreihen, sondern Striae.

#### Beschreibung

Maße: Länge 8,92–9,95 mm. Breite 5,73–6,29 mm. – Relationen: Breite/Länge des Halsschildes 2,00–2,24; Breite Hinterecken/Breite Vorderecken des Halsschildes 1,87–1,96. Länge/Breite der Flügeldecken 1,34–1,38; Länge Flügeldecken/Länge Halsschild 3,88–4,32; maximale Breite Flügeldecken/maximale Breite Halsschild 1,39–1,44.

Farbe: Clypeus und Wangen dunkelbraun. Halsschild anthrazitfarben, leicht glänzend. Flügeldecken dunkelgrün, leicht glänzend. Beine einschließlich Femora und Fühler rotbraun. Unterseite schwarz, glänzend.

Kopf: Stirn mittelbreit, annähernd so breit wie die Länge des 3. Antennomers; Stirn bei den ♀♀ breiter als bei den ♂♂. Wangen enden vorne etwa auf der Höhe des mittleren Teils der Stirnnaht, etwas gewölbt. Stirnnaht in der Mitte leicht bogenförmig, nur in der Mitte etwas eingedrückt und eingeschnitten. Clypeus vorgezogen, leicht quer und längs gewölbt. Clypeus und Stirn fein und weitläufig punktiert. Mandibeln apikal bifid.

Halsschild: Quer und längs nur gering, aber gleichmäßig gewölbt. Seiten verengen sich gebogen nach vorne. Vorderrand ausgeschnitten, so dass bei Aufsicht die Vorderecken leicht spitzwinklig erscheinen. Seiten gerandet. Randung des Vorderrandes median abgeschwächt. Bei Blick von oben sind die Randungen der Seiten in der ganzen Länge, vorne aber nur schmal, sichtbar. Bei Ansicht von der Seite sind die Vorderecken rechtwinklig, die Hinterecken verrundet stumpfwinklig. Oberseite mit winzigen, weitläufig stehenden Punkten.

Scutellum: Dreieckig, unpunktiert.

Flügeldecken: Breit, quer und längs deutlich gewölbt. Größte Höhe etwa in der Mitte. Zwischen den Schultern und dem Beginn des hinteren Drittels subparallele Seiten. Schulterbeulen vorhanden. Enden der Flügeldecken gemeinsam verrundet. Seitenrandkanten von oben kaudad der Schultern in der ganzen Länge schmal sichtbar. Auf der Oberseite Punktreihen sehr großer Punkte mit einer breiten Basis; sie lassen sich im Bereich des Apex nicht mehr sicher bestimmten Reihen zuordnen; in der 4. Reihe etwa 15 Punkte. Interstitien nicht breiter als die Breite der Punkte der Reihen, flach, unpunktiert.

Prosternum: Vorderrand durchgehend schmal aufgebogen, kaum zur Apophyse hin eingezogen; von dem Rand ausgehend zieht median ein schmaler Kiel etwas in die Apophyse hinein; ein schmaler, niedriger, medianer Kiel findet sich auch unmittelbar vor dem Apex. Die Apophyse ist schmal, sie steigt zwischen Vorderrand und Hüften leicht ventrad an und ist hinter den Hüften leicht herabgebogen; neben den Hüften sind die Seitenränder etwas verbreitert, aber nur gering ventrad angehoben; hinter den Hüften etwas verschmälert und mit einer seichten medianen Furche.

Mesosternum: Vorderrand des hinteren Teils median nur schwach ausgeschnitten. Hinterer Teil beiderseits tief gefurcht. Oberfläche sonst glatt.

Metasternum: Vorderrand zwischen den Mesocoxae verrundet, gerandet. Scheibe mit winzigen, schütter stehenden Punkten. Medianlinie fast in der ganzen Länge schwach eingeschnitten, etwas stärker unterhalb der vorderen Apophyse.

Sternite: Vorderrand des 1. Sternits zwischen den Metacoxae spitzbogig. Sternite nur mit winzigen, weitläufig stehenden Punkten. Analsternit apikomedian bei den ♂♂ stark eingedrückt, mit einem Kranz kurzer Haare um diesen Eindruck.

Fühler: Mittellang, sehr dünn, bei beiden Geschlechtern gleich lang, zurückgelegt nicht ganz die Mitte der Flügeldecken erreichend. Antennomer 11 auf einer Seite gerade, auf der anderen Seite verrundet. Die Längen und Breiten der Antennomeren 1–11 verhalten sich wie

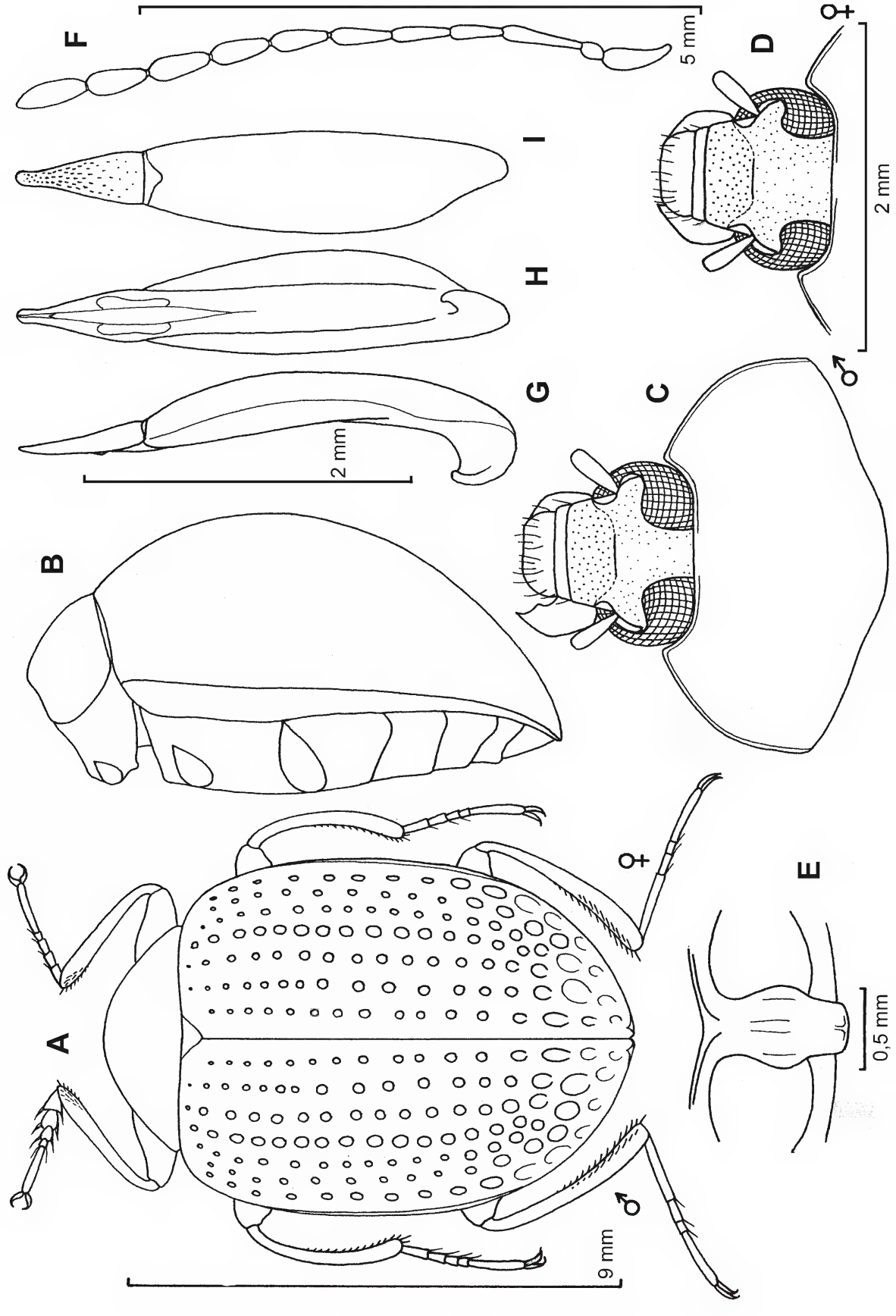


**Abb. 21.** *Amarygmus paradoxus* n. sp. – **A** Habitus; linksseitig Beine ♂, rechtsseitig Beine ♀. **B** Körper lateral. **C** Kopf und Halsschild, ♂. **D** Kopf, ♀. **E** Prosternalapophyse. **F** Fühler. **G** Aedoeagus lateral. **H** Aedoeagus ventral. **I** Aedoeagus dorsal.

14:5 / 6:4 / 17:4 / 10:4 / 11:4 / 11:4½ / 14:5 / 13:5 / 14:5 / 13:5 / 16:5.

Beine: Kurz, dünn. Femora mit einer schmalen Basis und zum zweiten Drittel hin keulenförmig verdickt. Tibiae leicht apikad verdickt. Protibiae sehr leicht gekrümmt. Mesotibiae deutlich gekrümmt. Metatibiae geringer als die Mesotibiae gekrümmt. Protarsomeren 1–3 der ♂♂ etwas verbreitert. Die Längen der Protarsomeren 1–5 bei einem ♂ sind 7:7:6:4:24, die der Mesotarsomeren 1–5 sind 11:8:6½:5:25, die der Metatarsomeren 1–4 sind 28:10:7:26.

Aedoeagus: Siehe Abb. 21G-I.

## *Amarygmus platolenoides* **n. sp.**
(Abb. 22A–I)

Holotypus (♂): Philippines, Leyte, Visca N Baybay, sec. forest, 100–200 m, 11.III.1991, leg. SCHAWALLER et al. (SMNS).

Paratypus: Gleiche Funddaten wie Holotypus (1 ♂ ZSMB).

### Etymologie

Die Gattung *Platolenes* Gebien, 1913 repräsentiert nach GEBIEN Amarygmini mit einer ähnlichen Form wie *Amarygmus*, die bei den ♂♂ verbreiterte Protarsomeren 1–3 besitzen. Die Protarsomeren der hier beschriebenen Art sind ebenfalls stark verbreitert, und diese Art wäre nach alter Nomenklatur in die Gattung *Platolenes* eingeordnet worden.

### Diagnose

Klein, länglich oval. Halsschild und Flügeldecken blau. Protarsomeren 1–3 der ♂♂ sehr stark verbreitert. Striae der Flügeldecken mit kleinen Punkten; Interstitien ziemlich deutlich punktiert.

*A. platolenoides* gehört zu einer Gruppe von philippinischen Arten, die eine längliche Gestalt, kombiniert mit stark verbreiterten Protarsomeren 1–3 der ♂♂ aufweisen, der Artengruppe um *A. angustus* Gebien, 1913.

Steht besonders dem etwas kleineren *A. mindanaensis* n. sp. nahe, der ebenfalls eine länglich ovale Gestalt und stark verbreiterte Protarsomeren bei den ♂♂ besitzt. *A. mindanaensis* weist etwas länglichere Flügeldecken als *A. platolenoides* auf, auf den Flügeldecken finden sich Punktreihen nicht verbundener, ziemlich großer Punkte, die in einigem Abstand voneinander liegen (kleine, eng beieinander liegende Punkte bei *A. platolenoides*), die Flügeldecken sind je nach Winkel des Lichteinfalls verschiedenfarbig (bei *A. platolenoides* einheitlich blau), die Stirn ist breiter und die Stirnnaht median nur sehr schwach eingeschnitten (bei *A. platolenoides* median stark eingedrückt und eingeschnitten).

Der ebenfalls auf den Philippinen vorkommende und einheitlich blau gefärbte *A. cyaneipennis* Pic, 1938 ist etwa gleich groß und von ähnlicher Gestalt wie *A. platolenoides*. Die Protarsomeren 1–3 sind bei den ♂♂ von *A. cyaneipennis* aber nicht verbreitert und die vorletzten Antennomeren sind deutlich länger.

### Beschreibung

Maße: Länge 4,94 + 5,37 mm. Breite 3,05 + 3,07 mm. – Relationen: Breite/Länge des Halsschildes 1,81 + 1,90; Breite Hinterecken/Breite Vorderecken des Halsschildes 1,78 + 1,81. Länge/Breite der Flügeldecken 1,44 + 1,48; Länge Flügeldecken/Länge Halsschild 3,62 + 3,80; maximale Breite Flügeldecken/maximale Breite Halsschild 1,35 + 1,39.

Farbe: Stirn, Halsschild und Flügeldecken blau, leicht mikroretikuliert. Halsschild etwas dunkler als Flügeldecken. Clypeus schwarz. Beine schwarzbraun, Tarsen braun, Protarsomeren heller braun als Metatarsomeren. Basale Antennomeren braun, apikale zunehmend schwarz. Unterseite dunkelbraun bis schwarzbraun, glänzend.

Kopf: Stirn nicht sehr breit, etwas schmaler als die Länge des 4. Antennomers (wie 10:11). Wangen schräg nach vorne ziehend und vorne etwa in Höhe der Stirnnaht endend, etwas gewölbt. Die Stirnnaht ist median tief eingeschnitten und eingedrückt, seitlich nur schwach eingeschnitten. Clypeus breit, mittelweit vorgezogen, längs deutlich gewölbt, quer schwach gewölbt. Clypeus und Stirn mit kleinen, nicht sehr dicht stehenden Punkten. Mentum umgekehrt trapezförmig, mit breiten, glänzenden Seitenrändern; median dazwischen matt und quer stark gewölbt. Unterseite des Halses fettig glänzend, mit einigen kleinen Punkten. Mandibeln apikal bifid.

Halsschild: Quer gewölbt, längs etwas geringer gewölbt. Seiten verengen sich gebogen nach vorne. Vorderrand etwas ausgeschnitten und Mitte sehr leicht vorgezogen. Vorderecken nicht vorstehend. Seitenränder und Vorderrand durchgehend gerandet. Bei Aufsicht sind die Randungen der Seiten nur in den hinteren drei Viertel sichtbar. Bei Ansicht von der Seite haben die Vorderecken einen Winkel von etwa 95°, die Hinterecken sind stumpfwinkliger. Oberseite dicht und klein punktiert.

Scutellum: Dreieckig, mit einigen winzigen Punkten.

Flügeldecken: Länglich oval. Quer und längs mäßiggradig gewölbt. Größte Höhe und Breite etwas vor der Mitte. Schulterbeulen nicht sehr ausgeprägt. Enden der Flügeldecken leicht zur Naht hin eingezogen. Seitenrandkanten von oben mit Ausnahme des Schulterbereiches schmal, aber durchgehend sichtbar. Auf der Oberseite durchgehende, feine Striae mit kleinen, runden Punkten; in der 4. Stria entsprechen die Abstände der Punkte etwa den Punktdurchmessern. Interstitien auf der Scheibe flach, seitlich leicht gewölbt, ziemlich dicht und fein punktiert.

Prosternum: Vorderrand seitlich schmal aufgebogen, median vor der Apophyse sehr leicht eingezogen, und

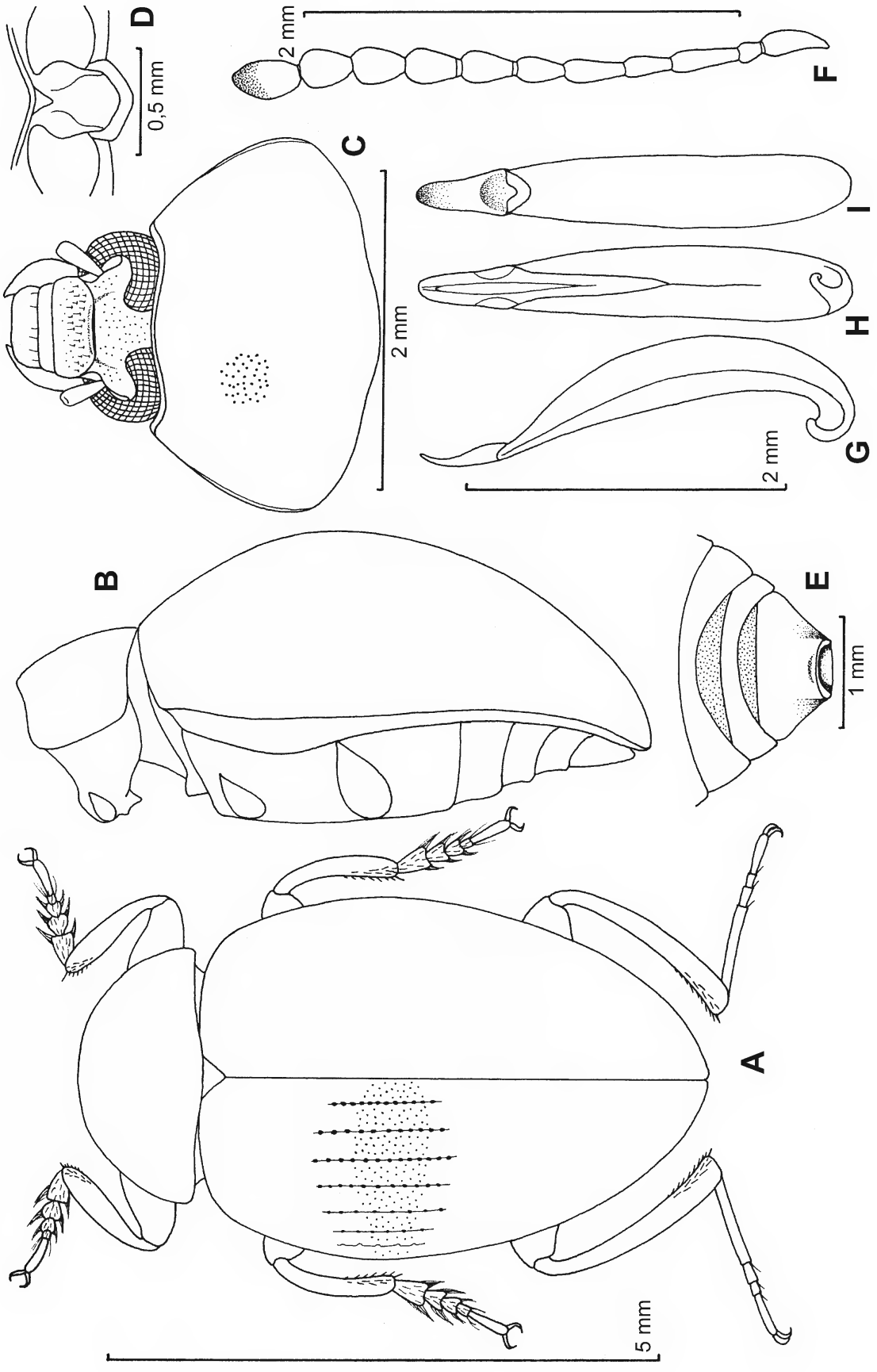


**Abb. 22.** *Amarygmus platolenoides* n. sp. – **A** Habitus, ♂. **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Sternite 3–5, ♂. **F** Fühler. **G** Aedoeagus lateral. **H** Aedoeagus ventral. **I** Aedoeagus dorsal.

die aufgebogene Randung dort dreieckig verdickt. Apophyse kurz; hinter den Hüften etwas herabgebogen, apikal mit einem schlecht abgegrenzten, verrundeten Abschluss; neben den Hüften Seitenränder leicht verbreitert und deutlich ventrad angehoben; dazwischen median eine breite Furche; hinter den Hüften verengen sich die schmal angehobenen Seitenränder etwas; hinter den Hüften ist der mediane Bereich quer etwas gewölbt; mit einigen zarten, aufragenden Haaren.

M e s o s t e r n u m : Vorderrand des hinteren Teils median ausgeschnitten; insgesamt ist der hintere Teil schmal, wenig strukturiert und mit einigen zarten Haaren.

M e t a s t e r n u m : Vorderrand zwischen den Mesocoxae schmal verrundet, gerandet. Vorderteil mit kleinen, Hinterteil mit winzigen Punkten. Mediannaht im hinteren Drittel schwach eingedrückt. Scheibe bei den ♂♂ (♀ unbekannt) mit zarten, meist anliegenden, ziemlich dicht stehenden Haaren.

S t e r n i t e : Vorderrand des 1. Sternits zwischen den Metacoxae spitzbogig, gerandet. Segmente seitlich geriefelt, median mit feinen Punkten. Median bei den ♂♂ auf den Sterniten 1 und 2 mit zarten, ziemlich dicht stehenden Haaren. Analsternit bei den ♂♂ apikomedian breit und sehr tief ausgeschnitten, außerdem sind bei den ♂♂ die Intersegmentalmembranen zwischen den Sterniten 3 und 4 sowie 4 und 5 stark verbreitert, wodurch die Sternite 3 und 4 median sehr kurz werden.

F ü h l e r : Nicht sehr lang, zurückgelegt etwa das erste Drittel der Flügeldecken überlappend. Antennomer 11 apikal schmal verrundet. Die Längen und Breiten der Antennomeren 1–11 verhalten sich wie 13:6 / 7:5 / 15:5 / 11:5 / 13:5½ / 11:6 / 13:7 / 12:7½ / 12:7½ / 11:7½ / 15:8.

B e i n e : Kurz. Femora zum zweiten Drittel hin stark keulenförmig verdickt. Protibiae apikad verdickt, annähernd gerade. Meso- und Metatibiae etwas gekrümmt. Protarsomeren 1–3 der ♂♂ mit abnehmender Tendenz stark verbreitert und verlängert, Protarsomer 4 nicht verbreitert. Mesotarsomeren 1–3 bei den ♂♂ ebenfalls verbreitert, aber nicht so stark wie die Protarsomeren 1–3. Die Längen der Protarsomeren 1–5 sind 10:8:7:6:18, die der Mesotarsomeren 1–5 sind 12:8:6:4:20, die der Metatarsomeren 1–4 sind 36:11:6:20.

A e d o e a g u s : Siehe Abb. 22G-I.

## *Amarygmus prolixus* **n. sp.**
(Abb. 23A–H)

H o l o t y p u s (♀): Philippines, N Luzon, 750 m, Kalinga-Apayao Pr., Cordillera Centr, Saltan upper valley, 17°30'N 121°08'E, 750 m, 22.III.2000, L. Dembický leg. (SMNS).

P a r a t y p e n : Philippines, N Luzon, Kalinga-Apayao Pr. boundary, Cordillera Centr., around Pass at 1600 ± 100 m, 17°30'N 121°00'E, 26.–28.III.2000, L. Dembický leg. (1 ♂ ZSMB). – Luzon, Manila, X.1913, leg. G. Boetticher (1 ♂, 1 ♀ NHMBF).

### Etymologie

Prolixus (lat.) = reichlich lang.

### Diagnose

Klein, langgestreckt oval, mit nach hinten etwas kontrakten Flügeldecken; auf ihnen sowohl Punktreihen, die inkonstant durch Striche miteinander verbunden sind, als auch Striae; Interstitien auf der Scheibe flach, seitlich hinten gewölbt. Stirn mittelbreit. Fühler mittellang. Metatibiae bei den ♂♂ nach dem basalen Viertel an der Innenseite abgeknickt und von dort apikad verbreitert.

Es handelt sich offensichtlich um ein Taxon mit einer gewissen Variabilität hinsichtlich Größe, Krümmung der Metatibiae und Mikroretikulierung. Ich betrachte hier alle aufgeführten Tiere als *A. prolixus* n. sp., kann jedoch nicht mit letzter Sicherheit ausschließen, dass sich darunter zwei Taxa verbergen. Die Entscheidung wird dadurch erschwert, dass von einer Form nur ♀♀, von der anderen nur ♂♂ vorliegen.

*A. prolixus* steht *A. iuventus* n. sp. nahe; zu den Unterschieden siehe bei *A. iuventus* n. sp.

### Beschreibung

M a ß e : Länge 4,36–5,33 mm. Breite 2,30–2,72 mm. – Relationen: Breite/Länge des Halsschildes 1,67–1,90; Breite Hinterecken/Breite Vorderecken des Halsschildes 1,56–1,59. Länge/Breite der Flügeldecken 1,62–1,76; Länge Flügeldecken/Länge Halsschild 3,59–4,10; maximale Breite Flügeldecken/maximale Breite Halsschild 1,23–1,33.

F a r b e : Kopf, Halsschild und Flügeldecken braun, mikroretikuliert, nicht glänzend, an den Seiten der Flügeldecken grün bis violett. Beine braun, Tarsen hellbraun. Antennomeren 1–6 hellbraun, 7–11 schwarzbraun. Unterseite braun, leicht mikroretikuliert.

K o p f : Stirn ziemlich breit. Wangen nach vorne über den Bereich des mittleren Teils der Stirnnaht hinausreichend, kaum gewölbt. Stirnnaht im mittleren Bereich durchscheinend, weder eingeschnitten noch eingedrückt, lateraler Teil der Stirnnaht nicht sichtbar. Clypeus gegenüber dem Vorderrand der Wangen nur wenig vorgezogen; flach. Stirn und Clypeus mit sehr weitläufig stehenden, feinen Punkten. Mentum umgekehrt trapezförmig, mit breiten, ebenen Seiten; median dazwischen matter, quer etwas gewölbt, median mit einer schmalen Längsspange. Unterseite des Halses mit flachen, mittelgroßen Punkten. Mandibeln außen gefurcht, apikal bifid.

H a l s s c h i l d : Ziemlich schmal, quer stark gewölbt, längs schwach gewölbt. Seiten nach vorne verschmälert, in der hinteren Hälfte mit geraden Seiten, davor mit gebogenen Seiten. Vorderecken bei Ansicht von oben nicht sichtbar, bei Ansicht von der Seite leicht verrundet. Vorderrand gerade. Seiten und Vorderrand durchgehend gerandet. Bei Aufsicht sind die Randungen der Seiten in den

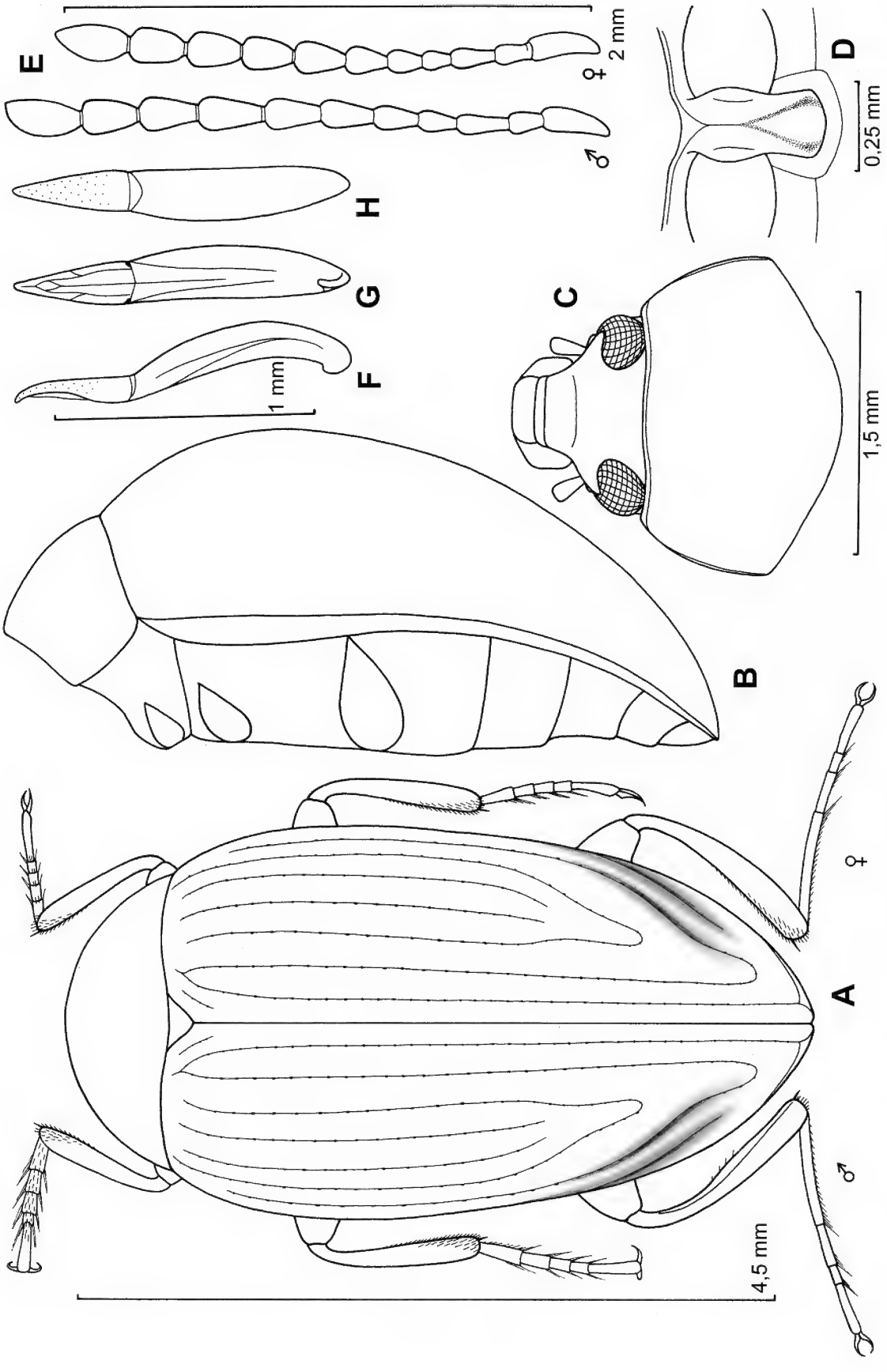


**Abb. 23.** *Amarygmus prolixus* n. sp. – **A** Habitus; linksseitig Beine ♂, rechtsseitig Beine ♀. **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Fühler, ♂ und ♀. **F** Aedoeagus lateral. **G** Aedoeagus ventral. **H** Aedoeagus dorsal.

hinteren drei Viertel sehr schmal sichtbar, davor nicht sichtbar. Bei Ansicht von der Seite sind Vorder- und Hinterecken leicht stumpfwinklig. Oberseite mit so winzigen, flachen, sehr weitläufig stehenden Pünktchen, dass sie in der Mikroretikulierung kaum auszumachen sind.

Scutellum: Dreieckig, unpunktiert.

Flügeldecken: Sehr langgestreckt und schmal, quer sehr stark gewölbt, längs deutlich gewölbt. Größte Breite und Höhe weit vorne, etwa nach einem Fünftel, dahinter leicht gebogen bis zum Apex verengt. Schulterbeulen sehr schwach entwickelt. Enden der Flügeldecken gemeinsam verrundet. Seitenrandkanten von oben nur im hinteren Viertel schmal sichtbar. Auf der Oberseite bei einem Exemplar kaum eingeschnittene Striae, bei dem anderen Exemplar finden sich in den ersten zwei Reihen Striae, die weiteren bestehen aus kleinen, länglichen Punkten, die inkonstant durch feine Striche miteinander verbunden sind; seitlich und hinten sind die Striae deutlich eingeschnitten. Interstitien auf der Scheibe flach, hinten und seitlich gewölbt, mit feinen, weitläufig stehenden Punkten.

Prosternum: Vorderrand seitlich schmal aufgebogen, median etwas zur Apophyse hin eingezogen und einen kurzen, dreieckigen Kiel in die Apophyse hinein sendend. Apophyse ziemlich schmal, zu den Hüften hin etwas angehoben; hinter den Hüften etwas herabgebogen, aber deutlich kaudad vorgezogen; neben den Hüften die Seiten etwas verbreitert und ventrad angehoben, dadurch entsteht dort median eine deutliche Furche; hinter den Hüften die Seiten subparallel; apikal breit zugespitzt; apikomedian ist der Bereich etwas angehoben.

Mesosternum: Hinterer Teil sehr schmal, Vorderrand median nur gering ausgeschnitten. Hinten findet sich median ein kleiner, auf die Randung des Metasternums weisender und diese etwas einkerbender Fortsatz.

Metasternum: Kahl bei beiden Geschlechtern. Vorderrand verrundet, gerandet; diese zwischen den Mesocoxae liegende Randung seitlich und median durch das Mesosternum etwas eingekerbt. Unpunktiert. Mediane Sutur hinten stark eingeschnitten.

Sternite: Vorderrand des 1. Sternits zwischen den Metacoxae spitzbogig, dick gerandet. Sternite nur mit winzigen, sehr weitläufig stehenden Pünktchen. Analsternit apikomedian bei den ♂♂ sehr tief eingedrückt und apikal etwas ausgeschnitten.

Fühler: Mittellang, zurückgelegt bei den ♀♀ etwa das erste Drittel der Flügeldecken überlappend, bei den ♂♂ etwas länger. Die Längen und Breiten der Antennomeren 1–11 verhalten sich beim ♀ wie 11:5 / 7:4 / 8:4 / 5:4½ / 5:5 / 7:5½ / 10:6 / 10:7 / 10:7 / 10:7 / 14:7, beim ♂ wie 11:5 / 6:4 / 10:3½ / 7:4 / 8:4 / 9:5½ / 11:6 / 11:6½ / 12:6½ / 11:6½ / 14:7.

Beine: Kurz. Femora abgeflacht, zum zweiten Drittel hin keulenförmig verdickt. Protibiae gerade. Mesotibiae sehr leicht gekrümmt, an der Innenseite im apikalen Drittel mit zarten, kurzen, schräg abstehenden Haaren. Metatibiae bei den ♂♂ im ersten Viertel basal gekrümmt, dann an der Innenseite abgeknickt und von dort apikad verbreitert, an der Außenseite in den apikalen drei Viertel gerade; bei den ♀♀ sind die Metatibiae innen und außen etwas gekrümmt. Pro- und Mesotarsomeren 1–3 der ♂♂ etwas verlängert, leicht verbreitert und auf der Volarseite sehr dicht behaart. Die Längen der Protarsomeren 1–5 beim ♀ sind 5:5:4:4:16, die der Mesotarsomeren 1–5 sind 10:8:5:5:16, die der Metatarsomeren 1–4 sind 31:13:8:17; beim ♂ sind die Längen der Protarsomeren 1–5 wie 9:7:5:3:17.

Aedoeagus: Siehe Abb. 23F-H.

## *Amarygmus pseudometallicus* **n. sp.**
(Abb. 24A–H)

Holotypus (♂): Mt. Apo, Mindanao, Philippine[s] (CA).

### Etymologie

Pseudometallicus = ähnelt sehr dem *A. metallicus* (Perty, 1831).

### Diagnose

Geflügelt. Groß. Oberseite schwarz, glänzend. Länglich ovale Flügeldecken, die mit den Seiten des Halsschildes einen stumpfen Winkel bilden; leicht eingeschnittene Striae, in denen Punkte kaum zu erkennen sind; Interstitien unpunktiert; die Enden der Flügeldecken etwas zur Naht hin eingezogen. Halsschild relativ schmal. Stirn mittelbreit. Fühler lang und dünn. Beine lang und dünn. Punktierung der Unterseite sehr dicht, insbesondere beim ♂ auf dem Metasternum.

Erinnert bei flüchtiger Betrachtung an *A. metallicus* (Perty, 1831), jedoch sind die Flügeldecken bei *A. pseudometallicus* etwas kürzer, die größte Breite der Flügeldecken liegt weiter vorne, die Punkte in den Striae sind kleiner (dadurch die Struktur der Striae ähnlich der von *A. ovoideus* (Fairmaire, 1882)), der Halsschild ist schmaler und nicht nach hinten eingezogen, die Prosternalapophyse ist wesentlich kürzer und (im Gegensatz zu der von *A. metallicus*) median nicht gefurcht, das Metasternum ist beim ♂ sehr dicht punktiert und mittellang, nahezu anliegend behaart (bei *A. metallicus* fast ohne Punkte und Haare), die Metatibiae sind beim ♂ gerade (bei *A. metallicus* gekrümmt) und der Aedoeagus ist bei beiden Arten verschieden (vergleiche Abb. 24F–H und 37F–H).

### Beschreibung

Maße: Länge 8,28 mm. Breite 4,54 mm. – Relationen: Breite/Länge des Halsschildes 1,67; Breite Hinterecken/Breite Vorderecken des Halsschildes 1,57. Län-

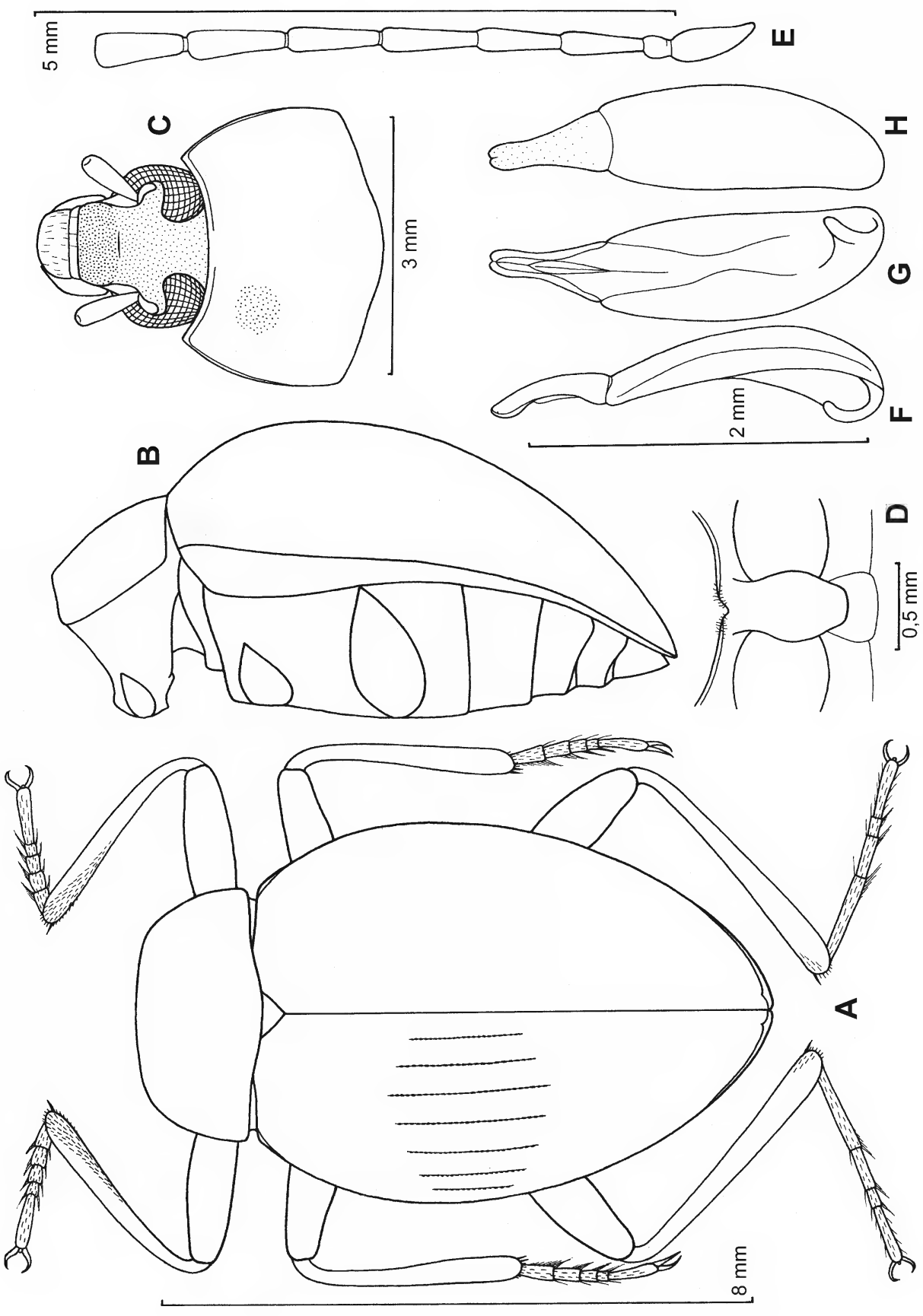


**Abb. 24.** *Amarygmus pseudometallicus* n. sp. – **A** Habitus, ♂. **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Fühlerglieder 1–8. **F** Aedoeagus lateral. **G** Aedoeagus ventral. **H** Aedoeagus dorsal.

ge/Breite der Flügeldecken 1,47; Länge Flügeldecken/ Länge Halsschild 3,50; maximale Breite Flügeldecken/ maximale Breite Halsschild 1,43.

Farbe: Oberseite schwarz, glänzend. Unterseite braun. Beine schwarzbraun. Fühler schwarz.

Kopf: Stirn mittelbreit, etwas schmaler als die Länge des 3. Antennomers (wie 14:16). Wangen kurz, bezogen auf den medianen Teil der Stirnnaht deutlich davor endend, gewölbt. Medianer Teil der Stirnnaht gerade, gering eingeschnitten, seitliche Teile kaum zu sehen. Clypeus vorgezogen, flach, liegt auf derselben Ebene wie die Stirn. Clypeus und Stirn sind fein und dicht punktiert. Mentum umgekehrt trapezförmig, mit breiten, flachen Seiten; dazwischen querüber gewölbt. Unterseite des Halses dicht, groß punktiert. Die Mandibeln weisen auf der Außenfläche zwei Furchen auf (und nicht eine, wie bei den meisten *Amarygmus*-Arten), apikal bifid (?).

Halsschild: Relativ schmal, quer stark gewölbt, längs schwach gewölbt. Seiten in der hinteren Hälfte subparallel, davor leicht gebogen verengt. Vorderecken rechtwinklig etwas vorstehend. Vorderrand deutlich ausgeschnitten. Seiten gerandet. Bei Aufsicht sind die Randungen der Seiten in der ganzen Länge (aber extrem schmal) sichtbar. Randung der Vorderseite in der Mitte unterbrochen. Bei Ansicht von der Seite sind die Vorderecken rechtwinklig, die Hinterecken stumpfwinklig. Oberseite mit nicht sehr dicht stehenden, feinen Punkten.

Scutellum: Dreieckig, unpunktiert.

Flügeldecken: Oval, bis zur Mitte quer stark gewölbt, dahinter graduell geringer gewölbt. Größte Höhe und Breite zu Beginn des zweiten Drittels. Schulterbeulen angedeutet. Enden der Flügeldecken etwas verrundet zur Naht hin eingezogen. Seitenrandkanten nur am Apex deutlich von oben sichtbar. Auf der Oberseite feine, durchgehende Striae, in denen die sehr kleinen Punkte kaum auffallen. Interstitien flach, mit winzigen, erst bei 25-facher Vergrößerung sichtbaren Pünktchen.

Prosternum: Vorderrand seitlich schmal aufgebogen, breit in der Mitte unterbrochen und schmal, muldenartig median eingezogen. Apophyse tropfenartig und insgesamt sehr grob, dicht punktiert; neben den Hüften etwas verbreitert, median ohne Furche; apikal verrundet; mit einigen mittellangen Haaren.

Mesosternum: Hinterer Teil schmal, ziemlich lang, am Vorderrand median nur gering ausgeschnitten; sehr dicht und groß punktiert, mit langen, gebogen abstehenden Haaren.

Metasternum: Vorderrand zwischen den Mesocoxae gebogen, dick gerandet. Scheibe sehr dicht, klein punktiert, mit zarten, herabgebogenen, langen Haaren; seitliche Bereiche mit größeren, flachen, dicht stehenden Punkten. Mediane Sutur von hinten bis kurz vor der Apophyse eingedrückt.

Sternite: Vorderrand des 1. Sternits zwischen den Metacoxae spitzbogig, schmal gerandet. Alle Sternite dicht, groß punktiert, auf der Scheibe mit leicht abstehenden, mittellangen Haaren. Analsternit apikomedian deutlich eingedrückt (sicher nur beim ♂).

Fühler: Lang und dünn, beiderseits nur die ersten 8 Antennomeren vorhanden. Die Längen und Breiten der Antennomeren 1–8 verhalten sich wie 17:6 / 6:5 / 16:5 / 17:5 / 19:5 / 18:5 / 17:5 / 17:8.

Beine: Lang. Femora zum zweiten Drittel hin nur gering keulenförmig verdickt. Protibiae an der Außenseite annähernd gerade, an der Innenseite apikad etwas verdickt. Mesotibiae außen gerade, ab der Hälfte etwas bauchig verdickt. Metatibiae annähernd gerade, apikad kaum verdickt. Protarsomeren beim ♂ nicht verbreitert. Die Längen der Protarsomeren 1–5 sind 6:6:6:5:15, die der Mesotarsomeren 1–5 sind 8:7:5:5:16, die der Metatarsomeren 1–4 sind 26:12:6:16.

Aedoeagus: Siehe Abb. 24F-H.

### *Amarygmus rugipectus* **n. sp.**
(Abb. 25A–E)

Holotypus (♀): Panay, Culasi, R. C. McGregor, *Amarygmus rugipectus*; [Gebiens Handschrift] *Amarygmus rugipectus* Geb., Type, H. Gebien det. 1921 (NHMBF).

#### Etymologie

Ich respektiere den Namen, den Gebien (in litt.) für dieses Taxon ausgewählt hat, obwohl sich die Unterseite nicht durch runzelige Strukturen auszeichnet.

#### Diagnose

Mittelgroß. Flügeldecken oval, quer und längs deutlich gewölbt, mit mittelgroß punktierten Striae und auf der Scheibe etwas gewölbten Interstitien. Fühler nicht sehr lang; Antennomeren 7–11 apikad nicht sehr stark verbreitert. Oberseite einheitlich blaugrün.

Die Fühlerform charakterisiert die Arten der Gruppe um *A. philippinensis* Gebien, 1944, zu der neben *A. rugipectus* auch noch *A. vulcanus* n. sp. und *A. langeri* n. sp. zu zählen sind. Die drei neu beschriebenen Arten besitzen neben der sehr ähnlichen Fühlerform auch eine ähnliche Gestalt und Größe. *A. philippinensis* und *A. langeri* haben Punktreihen nicht verbundener Punkte auf den Flügeldecken, *A. vulcanus* und *A. rugipectus* besitzen punktierte Striae mit zart verbundenen Punkten, die außerdem etwas eingedrückt sind. Die Interstitien auf der Scheibe bei *A. philippinensis* und *A. langeri* sind nicht gewölbt, bei *A. vulcanus* und *A. rugipectus* etwas gewölbt. *A. philippinensis* hat eine einheitlich anthrazitfarbene Oberseite (bei *A. rugipectus* blaugrün), *A. vulcanus* und *langeri* besitzen einen blauen Halsschild und je nach Einfallswinkel des Lichts unterschiedlich gefärbte Flügeldecken (*A. rugipectus* ist oben einheitlich blaugrün gefärbt). Es ist zu erwar-

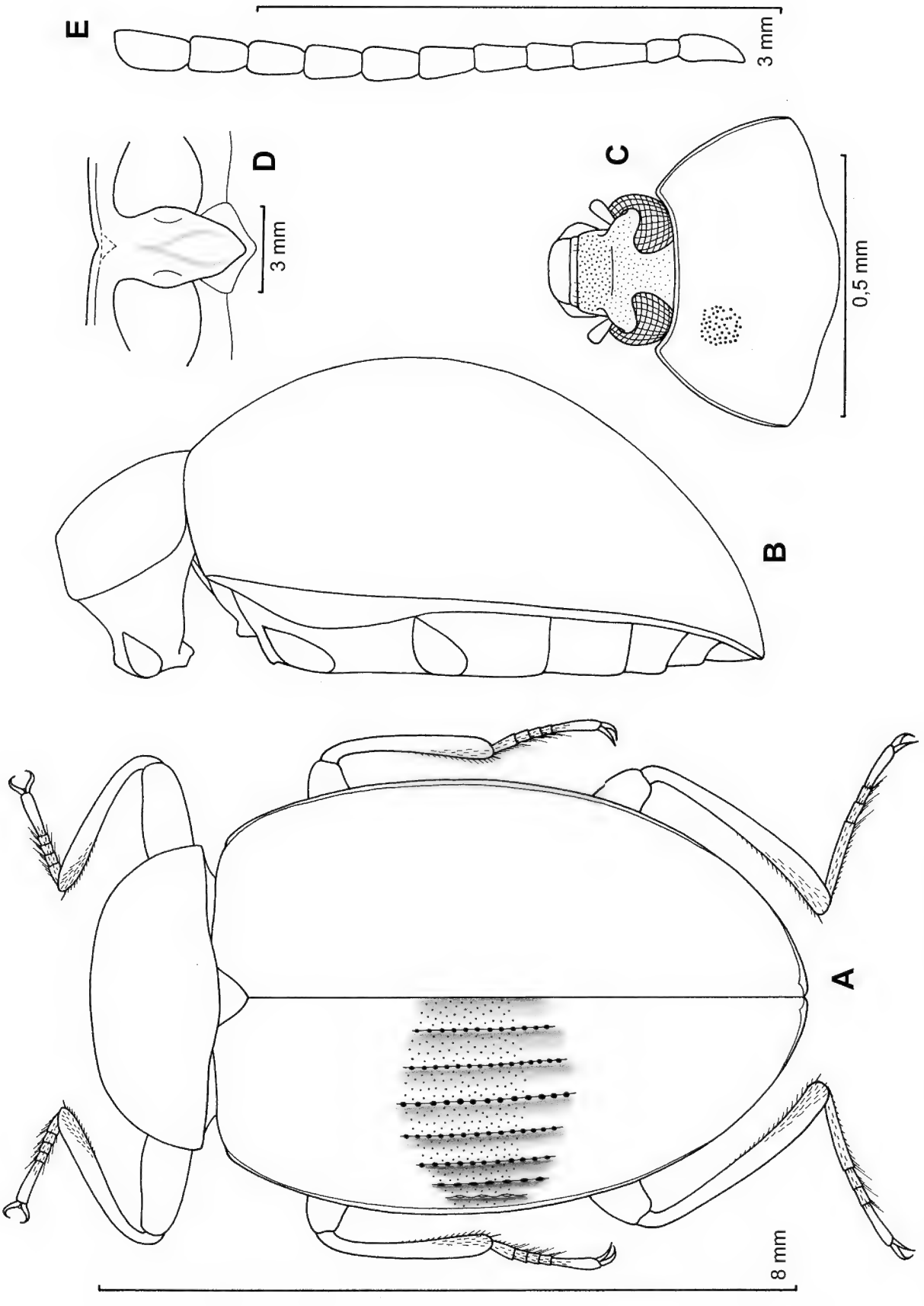


**Abb. 25.** *Amarygmus rugipectus* n. sp. – **A** Habitus, ♀. **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Fühler.

ten, dass bei den ♂♂ von *A. rugipectus* die Protarsomeren 1–3 nicht verbreitert sind.

### Beschreibung

Maße: Länge 7,56 mm. Breite 4,70 mm. – Relationen: Breite/Länge des Halsschildes 1,87; Breite Hinterecken/Breite Vorderecken des Halsschildes 1,95. Länge/Breite der Flügeldecken 1,37; Länge Flügeldecken/Länge Halsschild 3,52; maximale Breite Flügeldecken/maximale Breite Halsschild 1,37.

Farbe: Oberseite blaugrün, leicht matt. Beine dunkelbraun. Antennomeren 1–4 dunkelbraun, 5–11 schwarz. Unterseite braun, leicht glänzend.

Kopf: Stirn mittelbreit, die Breite entspricht etwa der Länge des 3. Antennomers. Wangen gewölbt, nach vorne nur wenig über die Mitte der Stirnnaht hinausreichend. Stirnnaht median leicht eingedrückt, sehr gering eingeschnitten. Clypeus vorgezogen, längs und quer etwas gewölbt. Clypeus und Stirn mit kleinen, deutlichen Punkten. Mandibeln außen gefurcht, apikal bifid.

Halsschild: Quer und längs etwas gewölbt. Seiten von hinten nach vorne verengt und leicht verrundet. Vorderrand deutlich ausgeschnitten. Vorderecken etwas vorragend, annähernd rechtwinklig. Hinterecken leicht stumpfwinklig. Seitenränder und Vorderrand durchgehend gerandet. Bei Aufsicht sind die Randungen der Seiten in der ganzen Länge gut sichtbar. Bei Ansicht von der Seite sind die Vorderecken rechtwinklig, die Hinterecken leicht stumpfwinklig. Oberseite mit deutlichen, kleinen, ziemlich dicht stehenden Punkten.

Scutellum: Dreieckig, mit einigen winzigen Punkten.

Flügeldecken: Oval, quer stark, längs deutlich gewölbt. Größte Breite und Höhe zu Beginn des zweiten Drittels. Schulterbeulen angedeutet. Enden der Flügeldecken gemeinsam verrundet. Seitenrandkanten von oben in der gesamten Länge sehr schmal sichtbar. Oberseite mit Striae, deren mittelgroße Punkte durch zarte Striche verbundenen sind, die Punkte der Striae haben auf der Scheibe in der 4. Reihe einen Abstand voneinander, der etwa den Punktdurchmessern entspricht; in der 4. Reihe etwa 36 Punkte. Interstitien auf der Scheibe leicht, seitlich hinten deutlich gewölbt, mit kleinen, deutlichen Punkten.

Prosternum: Vorderrand durchgehend schmal aufgebogen, median kaum zur Apophyse hin eingezogen. Apophyse länglich oval, ihre Seiten neben den Procoxae etwas ventrad angehoben, median findet sich dort eine tiefe Furche; apikal verrundet; mit einigen schräg aufgerichteten, kurzen Haaren.

Mesosternum: Vorderrand median tief ausgeschnitten. Mit angedeuteten seitlichen Furchen und einigen, teils halb aufgerichteten, teils anliegenden, zarten Haaren.

Metasternum: Vorderrand zwischen den Mesocoxae verrundet, dick gerandet. Im vorderen Teil einige kleine Punkte und schrägstrichige Strukturen; der größte Teil der Scheibe mit ziemlich dicht stehenden, feinen Punkten, aus denen winzige bis kurze Härchen entspringen. Mediane Sutur weder eingeschnitten noch eingedrückt.

Sternite: Vorderrand des 1. Sternits zwischen den Metacoxae spitzbogig, gerandet. Die ersten zwei Sternite mit kleinen, verwaschenen Punkten, die dahinter liegenden Sternite mit noch kleineren Punkten, auf den Scheiben mit anliegenden, kurzen Haaren, auf dem Analsternit sind diese Haare etwas länger.

Fühler: Nicht sehr lang. Die Antennomeren 7–10 besitzen gerade Seiten und verbreitern sich apikad nur wenig. Die Längen und Breiten der Antennomeren 1–11 verhalten sich wie 16:8 / 9:7 / 22:7 / 14:7½ / 15:7½ / 15:9 / 16:9 / 16:10 / 16:10 / 16:10 / 21:10.

Beine: Kurz. Femora zum zweiten Drittel hin keulenförmig verdickt. Protibiae und Mesotibiae apikad kaum verdickt, annähernd gerade. Metatibiae in der basalen Hälfte annähernd gerade, in der apikalen Hälfte leicht nach innen gekrümmt und innen mit schütter stehenden schräg abstehenden Borsten (wahrscheinlich bei beiden Geschlechtern). Die Längen der Protarsomeren 1–5 sind 8:7:6:6:26, die der Mesotarsomeren 1–5 sind 12:7:6:6:27, die der Metatarsomeren 1–4 sind 37:13:9:27.

## *Amarygmus schultzei* **n. sp.**
(Abb. 26A–H)

Holotypus (♀): Luzon, P. Benguet, Santo Tomas; *Amarygmus schultzei* Geb. [Gebiens Handschrift] (NHMBF).

Paratypen: Philippines, N Luzon, Mountain Prov., Bontoc region, NW of Barlig, 2000 m, 17°03'N 121°04'E, 9.IV.2000, L. Dembický leg. (1 ♀ SMNS). – Philippines, N Luzon, Kalinga-AP/Abra Pr. boundary Cordillera Centr., around Pass at 1600 ± 100 m, 17°30'N 121°00'E, 26.–28.III.2000 (1 ♀ SMNS, 1 ♂ ZSMB; beide beschädigt). – Philippines, Mt. Data, 2300 m, Bontoc Prov., Luzon, 7.–9.VI.1977, M. Sato leg. (1 ♂ CM). – Mt. Pangao, Bontoc Prov., Luzon, Philippines, 31.V.1977, Y. Kurosawa (1 ♂ CM).

### Etymologie

Gebien (in litt.) benannte diese Art *schultzei*. Ich respektierte die Namensgebung von Gebien.

### Diagnose

Geflügelt. Kleine, stark gewölbte, länglich ovale, farblich unauffällige Art. Punktreihen kleiner Punkte auf den Flügeldecken. Prosternalapophyse sehr schmal, median sehr tief und schmal gefurcht, apikal herabgedrückt und zugespitzt. Auffällig auch durch den Farbkontrast zwischen dunkler Oberseite und den fahlen, meist gelbbraunen Tibiae und Fühlern.

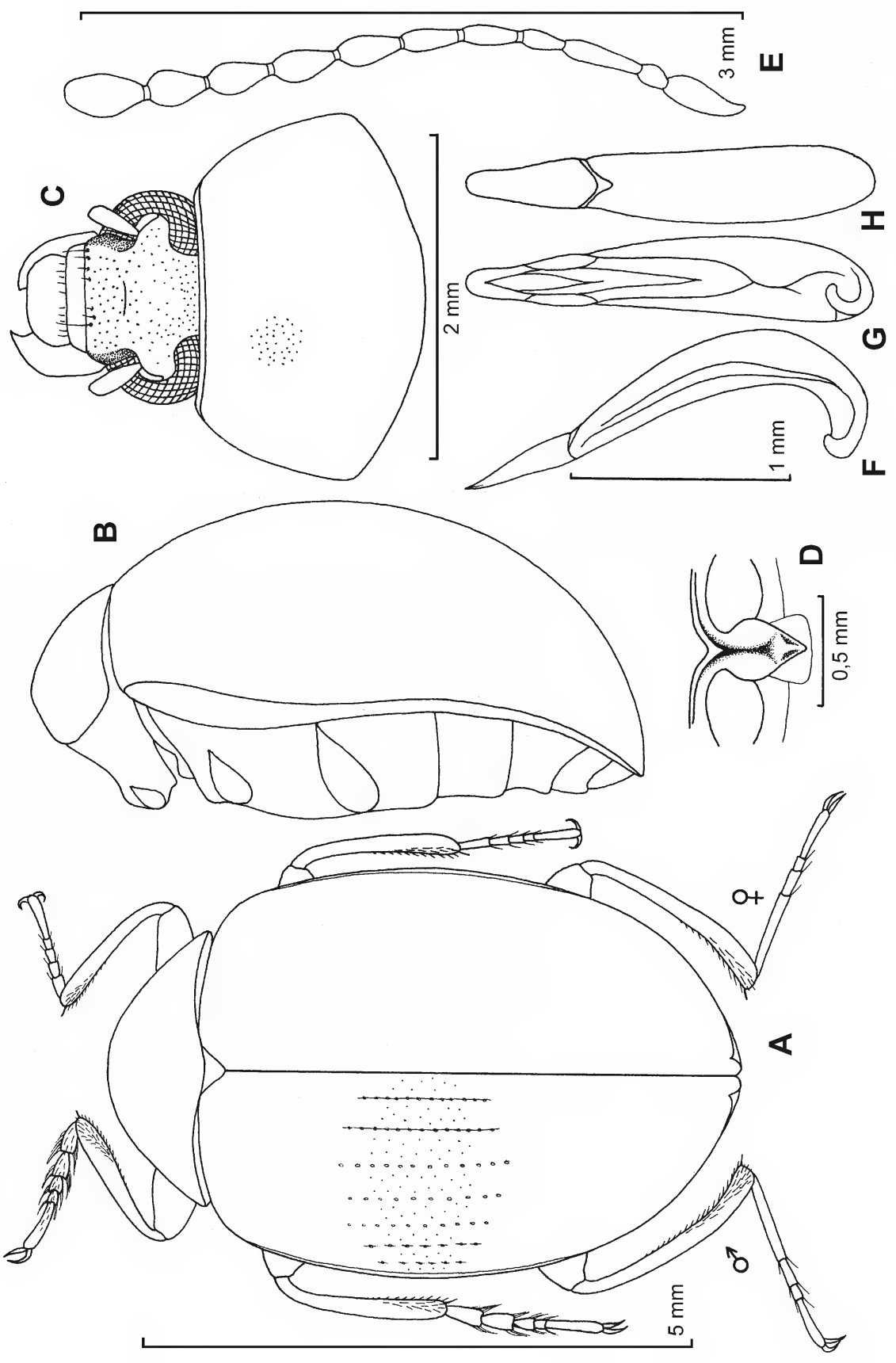


**Abb. 26.** *Amarygmus schultzei* n. sp. – **A** Habitus; linksseitig Beine ♂, rechtsseitig Beine ♀. **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Fühler. **F** Aedoeagus lateral. **G** Aedoeagus ventral. **H** Aedoeagus dorsal.

Eine ähnliche Gestalt und ebenfalls Punktreihen kleiner Punkte besitzen der etwas größere *A. dissimilis* n. sp. aus Mindanao, der aber eine sehr farbige Oberseite aufweist (siehe bei *A. dissimilis*), sowie *A. lugubris* n. sp. (siehe Abb. 13).

Beschreibung

Maße: Länge 5,33–6,05 mm. Breite 3,17–3,66 mm. – Relationen: Breite/Länge des Halsschildes 1,77–1,88; Breite Hinterecken/Breite Vorderecken des Halsschildes 1,76–1,78. Länge/Breite der Flügeldecken 1,36–1,46; Länge Flügeldecken/Länge Halsschild 3,44–3,70; maximale Breite Flügeldecken/maximale Breite Halsschild 1,35–1,45.

Farbe: Halsschild schwarzbraun. Flügeldecken dunkelbraun. Halsschild schwach, Flügeldecken stärker mikroretikuliert, leicht glänzend. Unterseite dunkelbraun bis schwarz, deutlich mikroretikuliert, leicht glänzend. Femora meist etwas heller als die Unterseite. Tibiae, Tarsen und Fühler gelbbraun.

Kopf: Stirn ziemlich breit, flach, breiter als die Länge des 3. Antennomers (wie 24:18). Wangen kurz, schmal, leicht gewölbt. Stirnnaht als sehr schmaler Strich angedeutet, aber nicht eingeschnitten. Clypeus nicht sehr weit vorgezogen. Clypeus und Stirn mit kleinen Punkten, die auf dem Clypeus dichter als auf der Stirn stehen. Mentum herzförmig, mit gebogenen, breiten, etwas glänzenden Seiten; median dazwischen matt, gewölbt. Unterseite des Halses mikroretikuliert, mit wenigen, sehr flachen, mittelgroßen Punkten. Mandibeln außen gefurcht, apikal bifid.

Halsschild: Ziemlich schmal, quer stark gewölbt, längs deutlich gewölbt. Seiten verengen sich nach vorne, in den hinteren drei Fünftel mit geraden Seiten, in den vorderen zwei Fünftel gebogen. Vorderrand gerade. Vorderecken nicht vorgezogen. Seitenränder und Vorderrand durchgehend gerandet. Bei Ansicht von oben sind die Randungen der Seiten nur hinten schmal sichtbar, Vorderecken nicht sichtbar. Bei Ansicht von der Seite sind die Vorder- und Hinterecken gleich stark stumpfwinklig. Oberseite mit feinen, nicht sehr dicht stehenden Punkten.

Scutellum: Dreieckig, mit einigen winzigen Punkten.

Flügeldecken: Länglich oval, quer stark, längs deutlich gewölbt. Größte Höhe etwa in der Mitte. Schulterbeulen deutlich. Enden der Flügeldecken gemeinsam verrundet. Seitenrandkanten von oben nur in der Mitte sehr schmal sichtbar. Auf der Oberseite Punktreihen kleiner Punkte, die in den ersten zwei Reihen ziemlich eng, in den weiteren Reihen voneinander entfernter stehen; in den ersten Reihen sind die Punkte inkonstant durch feine Striche miteinander verbunden; Abstände der Punkte voneinander auf der Scheibe in der 4. Reihe entsprechen etwa dem 1- bis 2-fachen der Punktdurchmesser; in der 4. Reihe etwa 30 Punkte. Interstitien flach, mit feinen bis winzigen, nicht sehr dicht stehenden Punkten auf mikroretikuliertem Grund.

Prosternum: Vorderrand durchgehend schmal aufgebogen; median vor der Apophyse stoßen beide Seiten in einem stumpfen Winkel zusammen, einen schmalen Kiel kurz in die Apophyse hinein sendend. Apophyse schmal, Seitenränder neben den Procoxae sehr stark ventrad angehoben; dazwischen median eine tiefe, schmale Furche; hinter den Hüften verengen sich die Seiten sofort zu einer apikalen Spitze, dabei sind sie herabgebogen.

Mesosternum: Hinterer Teil schmal, vorne median sehr wenig ausgeschnitten. Hinten beiderseits angedeutet gefurcht.

Metasternum: Vorderrand zwischen den Mesocoxae sehr schmal verrundet, gerandet, so dass auch die Apophyse schmal ist. Innerhalb der Apophyse schräge Eindrücke. Insgesamt mit feinen, sehr weitläufig stehenden Punkten, aus denen vorne einige mittellange, fast anliegende Haare entspringen. Medianlinie nur hinten schwach eingedrückt.

Sternite: Vorderrand des 1. Sternits zwischen den Metacoxae spitzbogig, gerandet. Scheiben der Sternite mit undeutlichen, feinen Punkten, von denen kurze, anliegende Haare ausgehen. Analsternit apikomedian bei den ♂♂ stark eingedrückt und mit einem Kranz kurzer Haare um den Eindruck.

Fühler: Mittellang, bei beiden Geschlechtern gleich lang, zurückgelegt nicht ganz die Mitte der Flügeldecken erreichend. Antennomer 11 apikal schmal verrundet. Die Längen und Breiten der Antennomeren 1–11 verhalten sich wie 15:7 / 7:5½ / 18:4½ / 12:4½ / 12:5 / 13:6 / 14:7½ / 14:8 / 14:8 / 13:8 / 17:9.

Beine: Kurz. Protarsomeren 1–4 bei den ♂♂ etwas verbreitert und verlängert. Femora zur Mitte hin keulenförmig verdickt. Pro- und Mesotibiae gerade bis sehr leicht gekrümmt. Metatibiae in der basalen Hälfte annähernd gerade, dann apikad einwärts gekrümmt. Die Längen der Protarsomeren 1–5 bei einem ♂ sind 12:11:6:5:21, die der Mesotarsomeren 1–5 sind 15:11:8:6:23, die der Metatarsomeren 1–4 sind 37:14:7:24.

Aedoeagus: Siehe Abb. 26F-H.

### *Amarygmus vicarius* **n. sp.**
(Abb. 27A–E)

Holotypus (♀): [gedruckt] Baltalasque, Luzon; [gedruckt] Philippinen (Böttcher); [gedruckt, oranges Papier] Allotype; [weißes Papier, handschriftlich] *Platolenes pulcher* Klzr. ♀, det. H. Kulzer, 1951 (NHMBF). – Das Exemplar ist beschädigt (vom linken Fühler sind nur die ersten beiden Antennomeren vorhanden, linkes Vorderbein und linkes Hinterbein fehlen, Metatarsomeren 1–4 fehlen).

Etymologie

Vicarius (lat.) = Stellvertreter.

## Diagnose

Groß, breit, leicht länglich oval, mit glänzender, farbiger Oberseite und farbigen Längsstreifen auf den Flügeldecken (grün, gelb, purpurfarben). Flügeldecken mit etwas eingedrückten Punktreihen dicht beieinander liegender, mittelgroßer Punkte; Interstitien auf der Scheibe leicht, seitlich deutlich gewölbt. Stirn mittelbreit. Protarsomeren 1–3 beim ♀ deutlich, Mesotarsomeren 1–3 leicht verbreitert.

Es besteht eine eigenartige Diskrepanz zwischen dem äußeren Sexualdimorphismus und den inneren Genitalorganen. Die üblicherweise männlichen äußeren Sexualmerkmale, wie die Verbreiterung der Protarsomeren 1–3, die schwächere Verbreiterung der Mesotarsomeren 1–3, die bürstenartige Behaarung der Pro- und Mesotarsomeren 1–4, und die dichte Behaarung der apikalen Innenseite der Pro- und Mesotibiae, kontrastieren gegenüber den weiblichen inneren Genitalorganen (eine kleine Einschränkung muss insofern gemacht werden, als offensichtlich KULZER bereits eine Genitaluntersuchung durchgeführt hatte, so dass die weiblichen Strukturen nicht mehr unverletzt vorhanden waren). Ich habe diese Diskrepanz zwischen sekundären Geschlechtsmerkmalen und Struktur der inneren Genitalorgane niemals bei anderen *Amarygmus*-Arten gefunden, obwohl ich bei sicher mehr als 1000 Einzeltieren eine Genitalpräparation vorgenommen habe.

In Größe, Körperform und Färbung der Oberseite ähnelt *A. vicarius* sehr dem *A. cuprarius* (Weber, 1801), aber die Stirn ist bei *A. vicarius* breiter und das ♀ besitzt verbreiterte Protarsomeren 1–3, während diese bei den ♂♂ und ♀♀ von *A. cuprarius* nicht verbreitert sind.

Da KULZER den Holotypus von *A. vicarius* als weiblichen Paratypus von *A. pulcher* (Kulzer, 1951) angesehen hat, sei auf die Gemeinsamkeiten und Unterschiede von *A. vicarius* und *A. pulcher* eingegangen: Gemeinsam ist beiden Arten die Größe und Färbung der Oberseite mit den farbigen Längsstreifen auf den Flügeldecken, außerdem ist die Stirnbreite beider Arten identisch und beide Arten besitzen verbreiterte Protarsomeren 1–3. Die Flügeldecken von *A. vicarius* sind jedoch wesentlich kürzer und breiter als bei *A. pulcher* (Länge/Breite der Flügeldecken 1,39 vs. 1,69) und der Halsschild ist breiter (Breite/Länge 1,97 vs. 1,83).

## Beschreibung

M a ß e : Länge 12,6 mm. Breite 7,3 mm. – Relationen: Breite/Länge des Halsschildes 1,97; Breite Hinterecken/Breite Vorderecken des Halsschildes 1,97. Länge/Breite der Flügeldecken 1,39; Länge Flügeldecken/Länge Halsschild 3,56; maximale Breite Flügeldecken/maximale Breite Halsschild 1,30.

F a r b e : Oberseite stark glänzend, je nach Winkel des Lichteinfalls in den Spektralfarben reflektierend, dazu auf den Flügeldecken farbige Längsstreifen (purpurfarben, grün und gelb). Beine und Fühler schwarz. Unterseite schwarzbraun bis schwarz, nur sehr gering glänzend. Sternite deutlich matter als Metasternum.

K o p f : Stirn mittelbreit, breiter als die Länge des 3. Antennomers (wie 22:16). Wangen gewölbt, deutlich durch die Wölbung von der Stirn abgegrenzt, nach vorne über den mittleren Teil der Stirnnaht hinausreichend. Stirnnaht median schräg zum Clypeus hin eingedrückt, kaum eingeschnitten. Clypeus mittelweit vorgezogen, im vorderen Teil längs gewölbt. Clypeus und Stirn mit feinen, verwaschenen, ziemlich dicht stehenden Punkten. Mandibeln apikal fast gerade, mit einer schwachen, asymmetrisch gelegenen Kerbung dort, wo die Außenfurche den Apex erreicht.

H a l s s c h i l d : Breit, quer und längs leicht gewölbt. Seiten verengen sich verrundet nach vorne. Vorderecken schmal verrundet. Hinterecken bei Aufsicht leicht stumpfwinklig. Vorderrand stark ausgeschnitten. Seitenränder und Vorderrand durchgehend gerandet. Bei Aufsicht sind die Randungen der Seiten gut sichtbar. Bei Ansicht von der Seite sind die Vorderecken rechtwinklig, die Hinterecken leicht stumpfwinklig. Oberseite mit kleinen, deutlichen, ziemlich dicht stehenden Punkten.

S c u t e l l u m : Dreieckig, mit feinen Punkten.

F l ü g e l d e c k e n : Breit, leicht länglich oval, quer und längs nicht sehr stark gewölbt. Größte Höhe und Breite kurz vor der Mitte. Kleine Schulterbeulen vorhanden. Enden der Flügeldecken gemeinsam verrundet. Seitenrandkanten von oben in den basalen zwei Drittel schmal sichtbar, dahinter von den gewölbten Interstitien überwölbt. Auf der Oberseite etwas eingedrückte Punktreihen mit eng stehenden, mittelgroßen Punkten; die Punkte sind nicht durch Striche miteinander verbunden; in der 4. Reihe entsprechen auf der Scheibe die Abstände der Punkte voneinander den Punktdurchmessern; in der 4. Reihe etwa 50 Punkte. Interstitien auf der Scheibe etwas, seitlich deutlich gewölbt, relativ dicht und fein punktiert.

P r o s t e r n u m : Vorderrand seitlich schmal aufgebogen, median mit einer kleinen Ausziehung in Richtung Apophyse. Apophyse vorne ohne deutliche Seitenränder; neben den Hüften deutlich verbreitert und die breiten Seitenränder etwas ventrad angehoben, dazwischen eine breite, flache Furche; hinter den Hüften verengen sich die Seiten, apikal sind sie verrundet.

M e s o s t e r n u m : Hinterer Teil am Vorderrand median tief ausgeschnitten, mit akzentuierten Ecken des Ausschnitts. Hinten auf jeder Seite mit einer nicht sehr auffälligen Furche.

M e t a s t e r n u m : Vorderrand zwischen den Mesocoxae verrundet, dick gerandet, eingeschlossene Apophyse etwas gegenüber der Scheibe angehoben. Vorderer Teil der Scheibe mit kleinen, ziemlich dicht stehenden Punkten, hinterer Teil mit feinen, ziemlich dicht stehenden

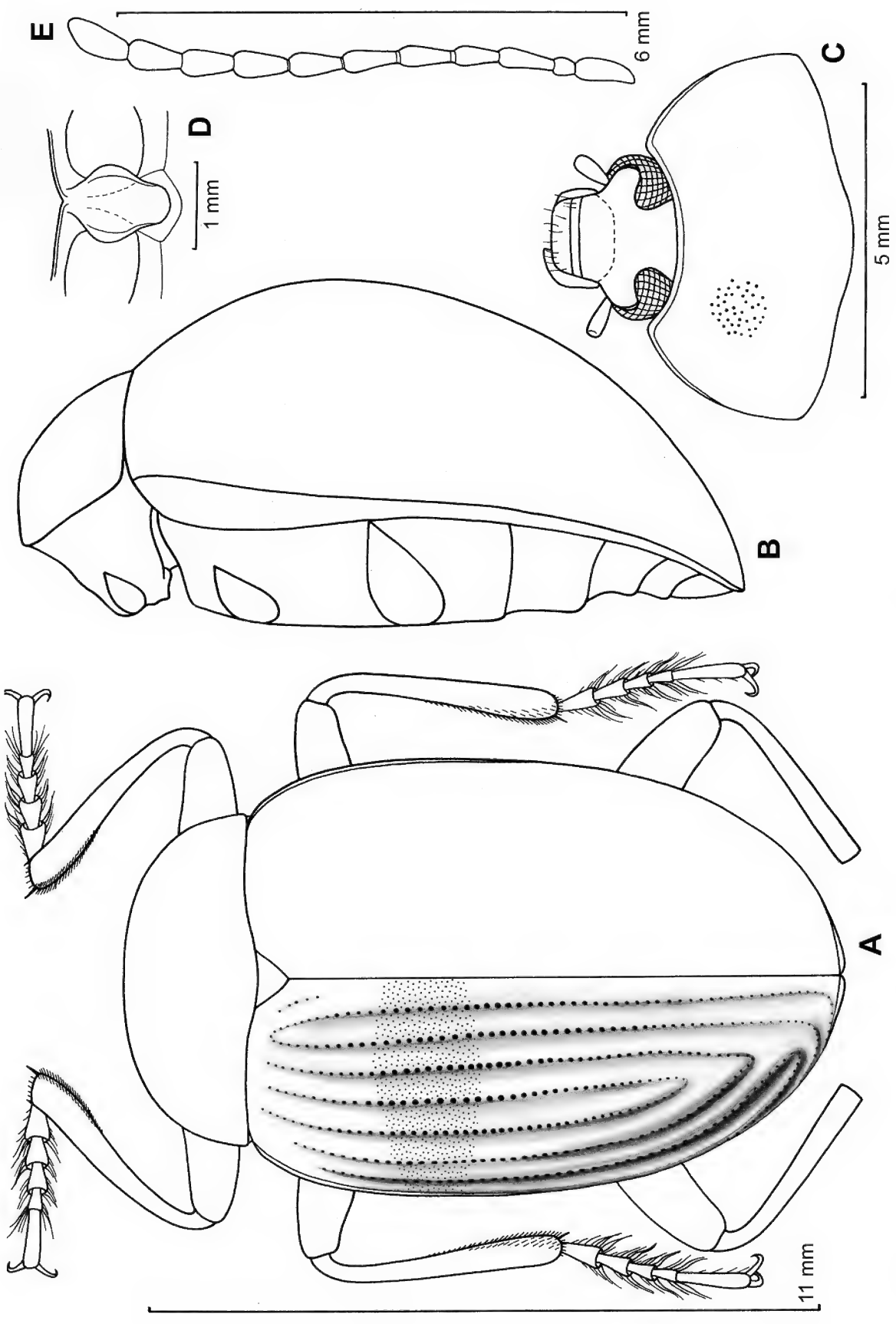


**Abb. 27.** *Amarygmus vicarius* n. sp. – **A** Habitus, ♀. **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Fühler.

Punkten. Mediane Sutur in der hinteren Hälfte etwas eingeschnitten.

S t e r n i t e : Vorderrand des ersten Sternits spitzbogig, vorne nicht, hinten seitlich schmal gerandet. Sternite 1 und 2 mit oberflächlichen, ziemlich dicht stehenden, kleinen Punkten. Sternite 3–5 nur mit winzigen Punkten. Analsternit apikal etwas verrundet herabgebogen.

F ü h l e r : Mittellang. Die Längen und Breiten der Antennomeren 1–11 verhalten sich wie 13:7 / 7:6 / 16:5½ / 13:6 / 15:6 / 16:6 / 15:7½ / 17:8 / 15:8 / 15:8½ / 19:9.

B e i n e : Mittellang, stabil. Femora zum zweiten Drittel hin gering verdickt. Protibiae außen in der apikalen Hälfte gerade, an der Innenseite in der apikalen Hälfte etwas verdickt und mit einem Feld dichter, anliegender, kurzer Haare. Mesotibiae außen in den apikalen vier Fünftel gerade, innen in der apikalen Hälfte leicht verdickt und mit einem Feld schäger, dicht stehender, mittellanger Haare. Metatibae außen in der apikalen Hälfte sehr leicht konkav, innen etwas verbreitert, ohne Haarfeld. Pro- und Mesotarsomeren 1–3 (letztere geringer) beim ♀ verbreitert. Die Längen der Protarsomeren 1–5 sind 11:10:8:6:25, die der Mesotarsomeren 1–5 sind 16:11:11:9:27. Metatarsomeren fehlen beim Holotypus.

## *Amarygmus vulcanus* **n. sp.**
(Abb. 28A–H)

H o l o t y p u s (♂): Mt. Caula-on [= Mt. Canlaon], Negros, Philippines, IV.2006, D. Mohagan leg. (FAEU).

P a r a t y p e n : Gleiche Funddaten wie Holotypus (10 ♂♂ CA, 5 ♂♂ ZSMB, 10 ♀♀ CA, 5 ♀♀ ZSMB). – Gleiche Funddaten wie Holotypus, aber IX.2006 (10 CA, 5 ZSMB, Geschlecht nicht untersucht).

### Etymologie

Vulcanus = römischer Gott der Feuerflamme. Diese Art wurde am Fuße des Vulkans Canlaon gesammelt.

### Diagnose

Mittelgroß, stark gewölbt, oval. Flügeldecken mit etwas eingedrückten Striae, die durch dicht stehende, kleine Punkte gebildet werden; Interstitien zwischen ihnen leicht gewölbt. Stirn mittelbreit. Fühler kurz, mit relativ gering voneinander separierten Antennomeren 5–11. Auffällig durch glänzend grünen Halsschild und dunkel purpurfarbene Flügeldecken.

Die neue Art gehört zu einer Artengruppe, die durch die Fühlerform charakterisiert wird; diese Gruppe umfasst *A. vulcanus* n. sp., *A. philippinensis* Gebien, 1944, *A. rugipectus* n. sp. und *A. langeri* n. sp. *A. vulcanus* steht besonders *A. rugipectus* von der Insel Panay nahe, weil beide Arten im Gegensatz zu *A. philippinensis* und *A. langeri* etwas eingedrückte Striae und damit gewölbte Interstitien besitzen. *A. rugipectus* hat im Gegensatz zu *A. vulcanus* eine einheitlich blaugrüne Oberseite.

### Beschreibung

M a ß e : Länge 7,17–8,28 mm. Breite 4,30–5,33 mm. – Relationen: Breite/Länge des Halsschildes 1,86–2,15; Breite Hinterecken/Breite Vorderecken des Halsschildes 1,87–2,00. Länge/Breite der Flügeldecken 1,32–1,40; Länge Flügeldecken/Länge Halsschild 3,48–3,74; maximale Breite Flügeldecken/maximale Breite Halsschild 1,34–1,38.

F a r b e : Clypeus braun. Stirn und Halsschild grün, glänzend (bei wenigen Exemplaren kupferfarben). Flügeldecken dunkel purpurfarben, etwas weniger als Halsschild glänzend. Unterseite schwarz (Metasternum glänzend, Sternite leicht matt). Femora und Tibiae schwarz, Tarsen dunkelbraun. Fühler schwarz.

K o p f : Stirn mittelbreit, etwas breiter als die Länge des 3. Antennomers (wie 23:20). Wangen seitlich deutlich den mittleren Teil der Stirnnaht nach vorne überlappend, aufgebogen. Stirnnaht etwas eingedrückt, andeutungsweise eingeschnitten. Clypeus mittelweit vorgezogen, längs etwas gewölbt. Clypeus und Stirn dicht und klein punktiert. Mentum ziemlich flach, mit verrundet nach vorne sich verbreiternden Seiten; verrundeter Übergang der Seiten zur Basis. Unterseite des Halses matt, mit sehr dicht stehenden, kleinen Punkten. Mandibeln außen gefurcht, apikal bifid.

H a l s s c h i l d : Breit, quer gleichmäßig gewölbt, längs leicht gewölbt. Seiten verengen sich verrundet nach vorne. Vorderrand deutlich und gleichmäßig ausgeschnitten, dadurch stehen die Vorderecken etwas vor. Seiten und Vorderrand durchgehend gerandet. Die Randungen der Seiten sind von oben in der ganzen Länge sichtbar. Bei Ansicht von der Seite sind die eckigen Vorderecken annähernd rechtwinklig, die Hinterecken stumpfwinklig. Oberseite mit gut markierten, dicht stehenden, kleinen Punkten, die median meist eine schmale Fläche unpunktiert lassen.

S c u t e l l u m : Dreieckig, mit wenigen winzigen Punkten.

F l ü g e l d e c k e n : Oval, längs und quer stark gewölbt. Größte Breite und Höhe etwa in der Mitte. Schultern etwas prominent. Enden der Flügeldecken gemeinsam verrundet. Seitenrandkanten schmal, aber fast in der ganzen Länge von oben sichtbar. Auf der Oberseite Punktreihen dicht stehender, mittelgroßer Punkte, die in einigen Reihen mit feinen Strichen verbunden sind, in anderen Reihen und bei anderen Exemplaren sieht man keine Verbindungen der Punkte der Reihen durch feine Striche; etwa 36 Punkte in der 4. Reihe. Interstitien auf der Scheibe andeutungsweise, seitlich leicht gewölbt, relativ dicht und fein punktiert.

P r o s t e r n u m : Vorderrand durchgehend schmal aufgebogen, sehr leicht median zur Apophyse hin eingezogen. Apophyse schmal, langgestreckt; apikal verrundet;

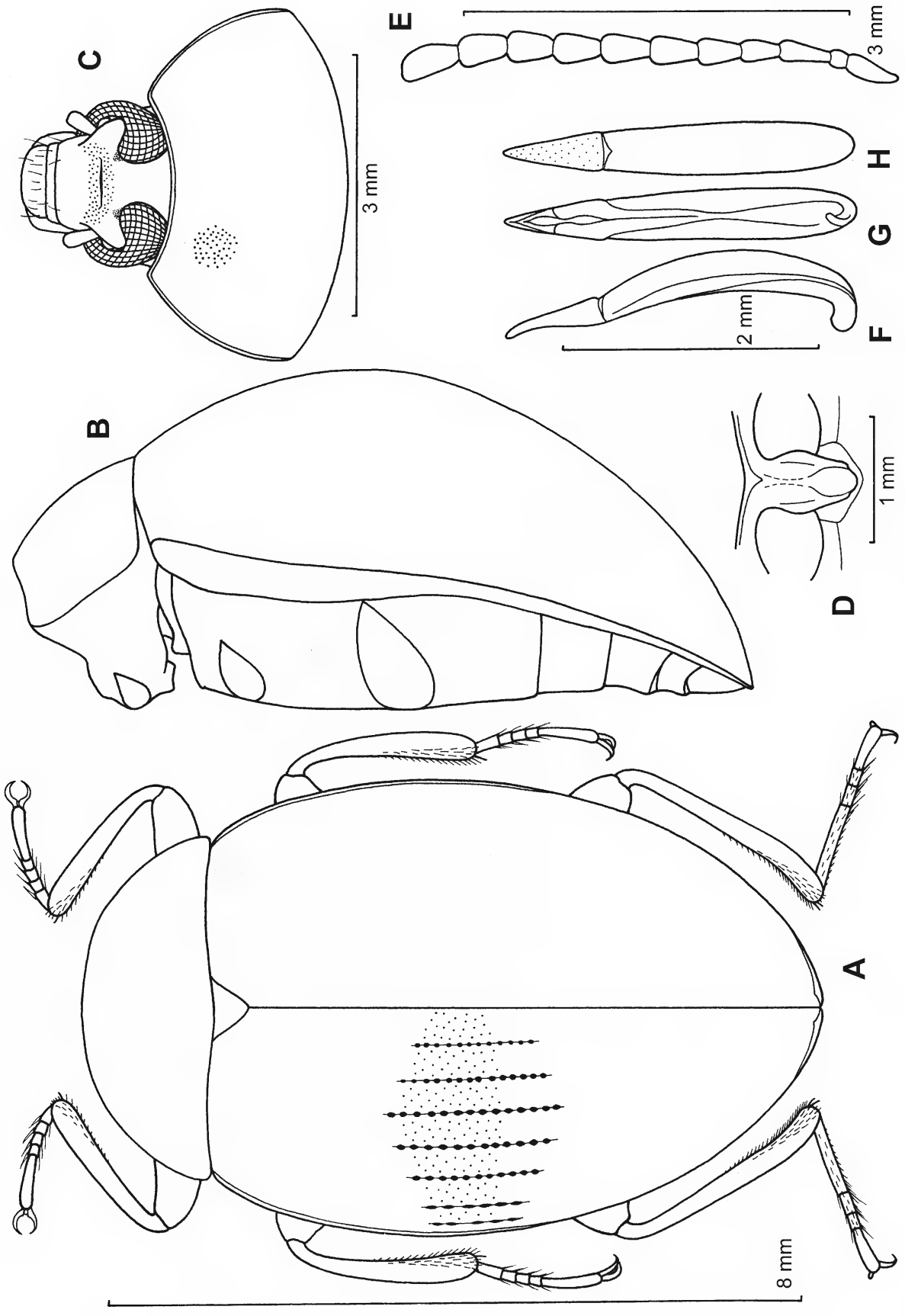


**Abb. 28.** *Amarygmus vulcanus* n. sp. – **A** Habitus. **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Fühler. **F** Aedoeagus lateral. **G** Aedoeagus ventral. **H** Aedoeagus dorsal.

neben den Procoxae etwas verbreitert; median zwischen den Hüften gefurcht.

Mesosternum: Vorderrand des hinteren Teils median ausgeschnitten, seitliche Ränder neben dem Ausschnitt aufgeworfen; hinterer Teil mit glatter Oberfläche, ohne wesentliche Strukturen, mit dünnen, aufragenden Haaren.

Metasternum: Vorderrand zwischen den Mesocoxae verrundet, dick gerandet; hinter der vorderen Randung mit etwa zwei Reihen mittelgroßer Punkte, dahinter auf der Scheibe bei den ♂♂ mit relativ dicht stehenden, feinen Punkten, die Ausgangspunkte nicht sehr langer, gekrümmter, dünner Haare sind. Mediane Sutur weder eingedrückt, noch eingeschnitten.

Sternite: Vorderrand des 1. Sternits zwischen den Metacoxae spitzbogig, schmal gerandet. Sternite auf den Scheiben mit winzigen Pünktchen, aus denen sehr kurze Härchen entspringen. Analsternit bei den ♂♂ ohne strukturelle Besonderheiten.

Fühler: Von mittlerer Länge, bei beiden Geschlechtern gleich lang. Antennomeren 6–11 relativ gering voneinander separiert. Die Längen und Breiten der Antennomeren 1–11 verhalten sich wie 16:9 / 8:7 / 20:8 / 14:9 / 16:9 / 18:11 / 19:12 / 18:12 / 18:12 / 18:12 / 23:11.

Beine: Kurz. Femora zum zweiten Drittel hin keulenförmig verdickt. Protibiae apikad etwas verdickt, annähernd gerade. Mesotibiae leicht gekrümmt, bei den ♂♂ an der Innenseite in der apikalen Hälfte mit nicht sehr dicht stehenden, dünnen Borsten. Metatibiae in den basalen zwei Fünftel annähernd gerade, apikal davon leicht gekrümmt. Protarsomeren bei den ♂♂ nicht verbreitert. Die Längen der Protarsomeren 1–5 sind 8:7:5:5:25, die der Mesotarsomeren 1–5 sind 10:8:6:4:24, die der Metatarsomeren 1–4 sind 33:11:8:27.

Aedoeagus: Siehe Abb. 28F-H.

## 4 Nachbeschreibungen und Anmerkungen zu bereits bekannten Arten der Gattung *Amarygmus*

### *Amarygmus allectorius* Bremer, 2002
(Abb. 29A–G)

*Amarygmus allectorius* Bremer, 2002: Bremer (2002a: 7–8).

#### Material

Mindanao, Mt. Apo, Ilomavis, 1400 m, 18.–19.V.1996, Bolm leg. (Holotypus ♂ SMNS). – Mindanao, Bukidnon Prov., 5 km N Malaybalay, 900 m, 12.V.1996, Bolm leg. (Paratypus ♀ SMNS). – Mindanao, 25 km NW of Zamboanga, 800 m, Camp Susana, 25.–30.IV.1996, Bolm leg. (Paratypus ♂ ZSMB).

#### Diagnose

Mittelgroße, länglich ovale Art mit stark gewölbten Flügeldecken. Charakterisiert durch die Makeln auf den Flügeldecken: Grundfarbe schwarz; auf jeder Flügeldecke drei große, rotgelbe Makeln, von denen die vorderen zwei durch ein schwarzes Längsband entlang der Naht getrennt werden; die rotgelben Makeln am Apex sind median nicht voneinander getrennt. Halsschild und Kopf schwarz. Interstitien der Flügeldecken flach. Striae auf den Flügeldecken. Prosternalapophyse schmal, lang und apikal zugespitzt. Fühler bei den ♂♂ wesentlich länger als bei den ♀♀. Vorderbeine bei den ♂♂ länger als bei den ♀♀.

Es handelt sich um die einzige, bisher von den Philippinen beschriebene Art mit Makeln auf den Flügeldecken.

*A. allectorius* gehört zu einer Gruppe verwandter Arten, die auf Taiwan, in Vietnam, Laos, Thailand bis Nepal sowie auf der Malayischen Halbinsel, den Großen Sunda-Inseln und auf Sulawesi vorkommen, wie *A. pilipes* Gebien, 1913, *A. fasciatus* Gebien, 1913, *A. diversipennis* Pic, 1922 und *A. ornatus* Bremer, 2004. Von diesen Arten unterscheidet sich *A. allectorius* durch das Makelmuster und – diskreter – durch Besonderheiten der Gestalt.

#### Ergänzende Beschreibung

Maße: Länge 6,6–8,5 mm. – Relationen: Länge/Breite der Flügeldecken 1,41–1,49. Die Längen der Metatarsomeren 1–4 sind 29:10:6:18.

### *Amarygmus angustus* Gebien, 1913
(Abb. 30A–I)

*Amarygmus angustus* Gebien, 1913: Gebien (1913: 419–420).
*Platolenes angustus*: Gebien (1920: 408) [comb. n.].
*Amarygmus angustus* Gebien, 1913: Bremer (2001a: 57) [stat. rehabil.].

#### Material

Philipp. I., Luzon, Mt. Makiling, C. Baker, *Platolenes angustus* Geb., [rotes Etikett] Type No. 323 (Holotypus ♂, NHMBF). – Philipp. I., Mt. Banahao, C. Baker (2 MNHP). – Mt. Banahao, C. F. Baker, 1919-207 (2 ♀♀ NHM). – Philippine Is., C. F. Baker, 1919-207, Mt. Makiling, Luzon (1 ♂ NHM). – Philippines, Negros, X.1994, leg. L. Mohagan (1 ♀ TTM). – Mt. Caula-on [= Mt. Canlaon], Negros, Philippines, I.2006, D. Mohagan leg. (1 ♀ CA). – Gleiche Funddaten wie vorstehend, aber IV.2006 (2 ♂♂ CA, 1 ♂ ZSMB, 1 ♀ CA, 1 ♀ ZSMB). – Island Sibuyan, Baker, *Platolenes angustus* Geb. [Gebiens Handschrift] (1 ♂ ZSM).

Anmerkung: Nach Gebiens Originalbeschreibung soll der singuläre Typus ausgezeichnet sein als „Nord-Luzon, Cap Engaño (Whitehead)", so dass zwischen Etikettierung des Holotypus und den Angaben in der Publikation eine Diskrepanz besteht. Außerdem steht „*Platolenes*" auf dem Etikett, während die Art als „*Amarygmus*" beschrieben wird. Gebien hat in Typenserien nie einen Holotypus ausgezeichnet, sondern die verschiedenen Exemplare nur als „Typus". Ich vermute daher, dass das Etikett „Holotypus" später von Kulzer hinzugefügt worden ist.

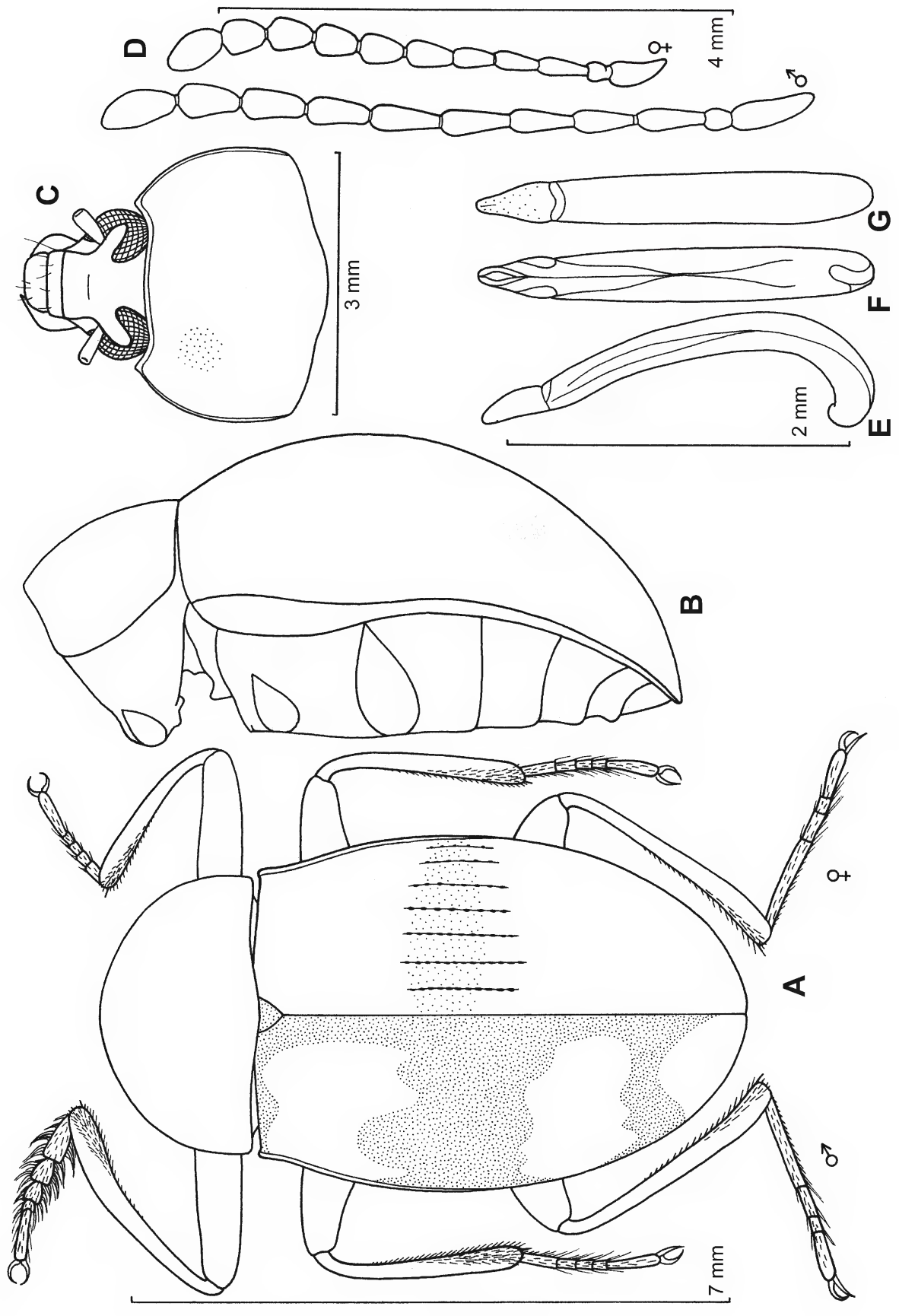


**Abb. 29.** *Amarygmus allectorius* Bremer, 2002. – **A** Habitus; linksseitig Beine ♂, rechtsseitig Beine ♀; auf der linken Flügeldecke findet sich das Muster der Makel. **B** Körper lateral. **C** Kopf und Halsschild. **D** Fühler, ♂ und ♀. **E** Aedoeagus lateral. **F** Aedoeagus ventral. **G** Aedoeagus dorsal.

Diagnose

Langgestreckte Art mit länglich ovalen Flügeldecken; quer und längs deutlich gewölbt. Kopfoberfläche flach, fein punktiert. Stirnnaht nur median schwach eingeschnitten. Wangen nicht gewölbt. Clypeus vor den Wangen nur kurz vorgezogen. Flügeldecken mit Punktreihen mittelgroßer Punkte, etwa 33 Punkte in der 4. Reihe; Interstitien flach, fein aber gut sichtbar punktiert. Bei den ♂♂ stark verbreiterte Protarsomeren 1–3 (in abnehmender Breite), wobei die folgenden Glieder auf der Oberseite der vorangehenden Glieder eingelenkt sind; Mesotarsomeren leicht verbreitert. Analsternit bei den ♂♂ apikomedian deutlich ausgeschnitten.

*A. angustus* ist durch die Form, die verbreiterten Protarsomeren 1–3 bei den ♂♂ und die farbigen Längsstreifen auf nicht sehr glänzenden Flügeldecken besonders ähnlich *A. eremitis* n. sp. und *A. bakeri* n. sp.; bezüglich der Unterschiede siehe die Diagnose der beiden Arten. Ebenfalls farbige Längsstreifen auf den Flügeldecken besitzen *A. pulcher* (Kulzer, 1951) und *A. vicarius* n. sp., aber diese zwei Arten haben im Gegensatz zu *A. angustus* stark glänzende Flügeldecken. Weitere Arten mit stark verbreiterten Protarsomeren 1–3 bei den ♂♂ sind *A. elytralis* Bremer, 2001 und *A. notabilis* n. sp., die aber im Gegensatz zu *A. angustus* tief eingeschnittene Striae auf den Flügeldecken besitzen.

Ergänzende Beschreibung

Maße: Länge 8,12–9,47 mm. Breite 4,30–4,82 mm. – Relationen: Breite/Länge des Halsschildes 1,69–1,89; Breite Hinterecken/Breite Vorderecken des Halsschildes 1,62–1,81. Länge/Breite der Flügeldecken 1,60–1,65; Länge Flügeldecken/Länge Halsschild 3,26–3,47; maximale Breite Flügeldecken/maximale Breite Halsschild 1,21–1,24. Die Längen und Breiten der Antennomeren 1–11 verhalten sich wie 15:9 / 10:8,5 / 21:8 / 18:8 / 22:10 / 21:10 / 21:11 / 20:11 / 20:11 / 20:11 / 26:11. Die Längen der Metatarsomeren 1–4 sind 32:12:7:19.

Farbe: Kopf, Halsschild und Flügeldecken farbig in den Spektralfarben, wobei sich auf den Flügeldecken die Farben meist in Längsrichtung ordnen. Glanz herabgesetzt durch deutliche Mikroretikulierung. Beine und Fühler schwarz. Unterseite schwarz.

## *Amarygmus breviculus* Bremer, 2001
(Abb. 31A–D)

*Amarygmus breviculus* Bremer, 2001: Bremer (2001b: 95).

Material

Luzon, Quezon N.P., Altimonan, Old Zigzag Road, 24.–30. III.1998, Zettel leg. (Holotypus NHMW; Geschlecht nicht untersucht).

Diagnose

Sehr klein, flügellos, fast kugelig mit hoch gewölbten, sehr kurzen Flügeldecken. Metasternum stark verkürzt. Beine ziemlich lang. Auf den Flügeldecken eingeschnittene Striae und etwas gewölbte Interstitien. Stirn sehr breit. Oberseite schwarz; Unterseite, Beine und Fühler braun.

*A. breviculus* wird durch diese Kurzbeschreibung und Abb. 31A–D ausreichend charakterisiert. Eine ähnliche Art ist mir von den Philippinen nicht bekannt, aber eine unbeschriebene Art von Morotai und Halmahera zeigt eine gewisse Ähnlichkeit.

Ergänzende Beschreibung

Maße: Länge 3,27 mm. – Relationen: Länge/Breite der Flügeldecken 1,09. Die Längen der Metatarsomeren 1–4 sind 30:9:5:15.

## *Amarygmus coloratus* (Kulzer, 1951)
(Abb. 32A–E)

*Platolenes coloratus* Kulzer, 1951: Kulzer (1951: 550).
*Amarygmus coloratus* (Kulzer, 1951): Bremer (2001a: 57).

Material

Basilan, Baker, *Platolenes coloratus* Klzr., det. H. Kulzer 1951 (Holotypus ♂ NHMBF; vom linken Fühler sind nur 5 Antennomeren vorhanden, rechter Fühler, rechte Pro- und Mesotarsen, rechtes Metatarsomer 4 und linke Metatarsomeren fehlen). – Island Samar, Baker, *Platolenes coloratus* Klzr., det H. Kulzer 1951 (Allotypus ♀ NHMBF). – Tangolan [= Tangcolan?], Bukidnon, Baker (Paratypus ♀ NHMBF). – Surigao, Mindanao, Baker (Paratypus ♀ NHMBF)

Anmerkungen: Der als Allotypus etikettierte Paratypus im NHMBF gehört einer anderen, unbeschriebenen Art an. Er ist länglicher und größer als der Holotypus, die seitlichen und hinteren Interstitien sind deutlich gewölbt und die Mesotibiae strikt gerade (anders als beim Holotypus). – Der Paratypus von Surigao ist sicher nicht *A. coloratus* (Kulzer, 1951), sondern wahrscheinlich ein unreifes Exemplar einer neuen Art affine *A. pulcher* (Kulzer, 1951). Bei diesem Exemplar stehen die Punkte der Punktreihen wesentlich enger als bei *A. coloratus*, und es ähnelt darin *A. pulcher*. Außerdem sind die Interstitien der Flügeldecken seitlich und hinten sehr deutlich gewölbt (diese Wölbung der Interstitien findet man nicht bei *A. coloratus*). Von *A. pulcher* unterscheidet sich das Exemplar durch langstreckig gerade Mesotibiae, während diese bei *A. pulcher* deutlich gebogen sind, außerdem hat es kürzere Antennomeren 6–10 als *A. pulcher* und ähnelt darin der Fühlerform, die man bei *A. coloratus* findet. – Ich beschreibe die beiden Arten nicht, solange mir keine ♂♂ vorliegen.

Diagnose

Länglich ovale Art mit farbigen Längsstreifen auf den Flügeldecken. Flügeldecken mit Punktreihen mittelgroßer Punkte, die in einigem Abstand voneinander stehen; Interstitien nicht gewölbt. Halsschild quer deutlich gewölbt. Stirn mittelbreit. Fühler mittellang. Mesotibiae deutlich gekrümmt. Halsschild grün, glänzend. Flügeldecken mit

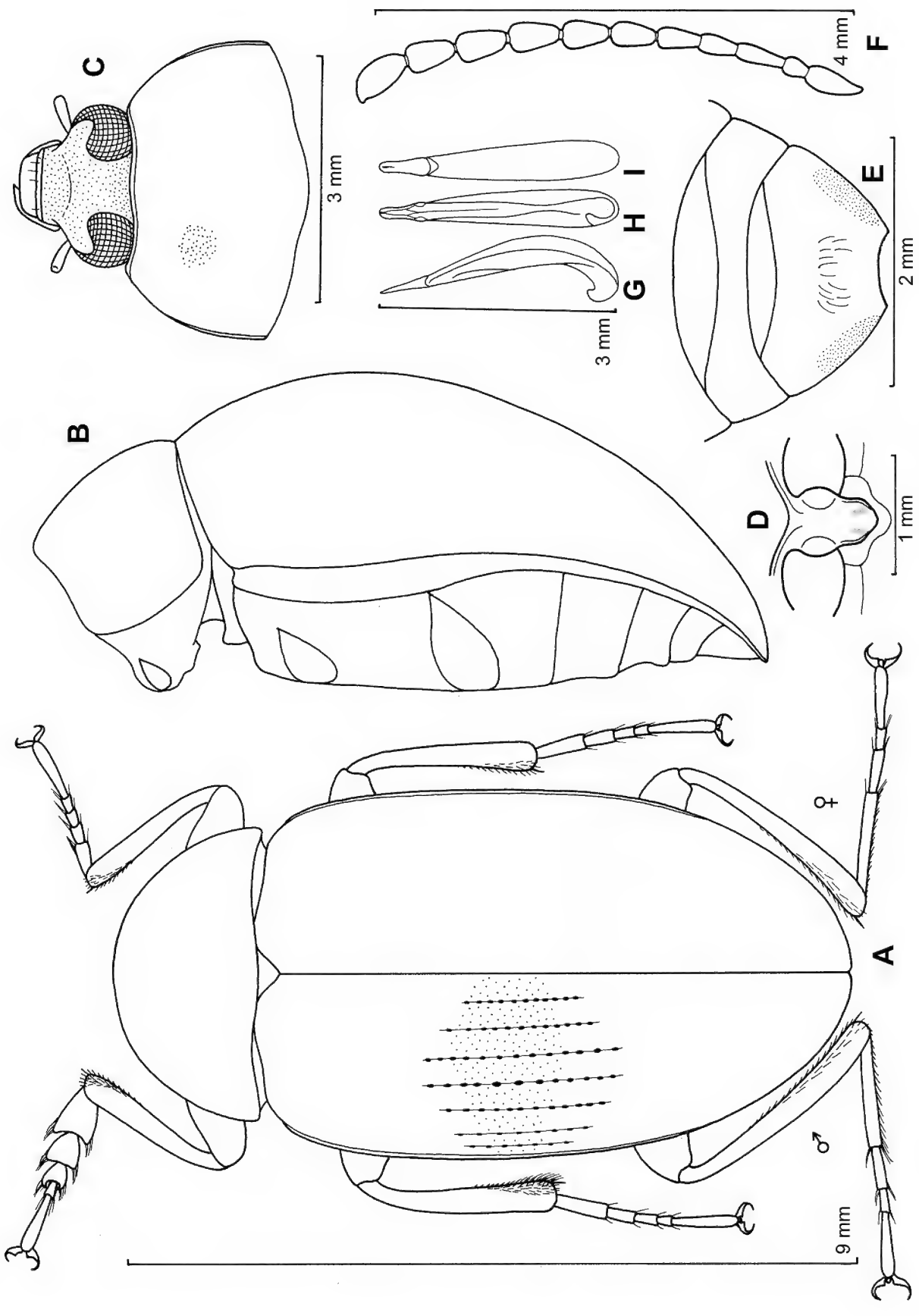


**Abb. 30.** *Amarygmus angustus* Gebien, 1913. – **A** Habitus; linksseitig Beine ♂, rechtsseitig Beine ♀. **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Sternite 4 und 5, ♂. **F** Fühler. **G** Aedoeagus lateral. **H** Aedoeagus ventral. **I** Aedoeagus dorsal.

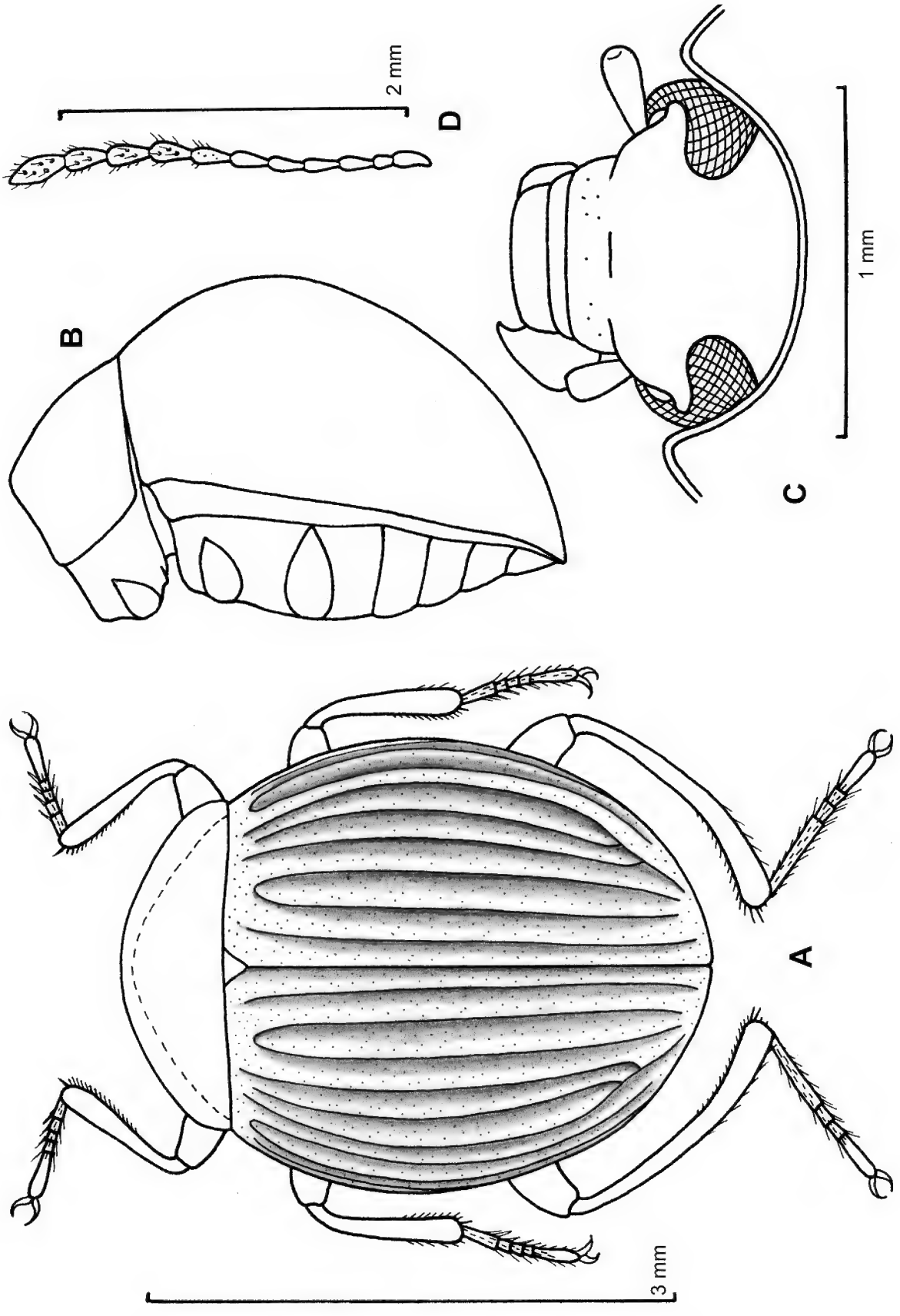


**Abb. 31.** *Amarygmus breviculus* Bremer, 2001. – **A** Habitus. **B** Körper lateral. **C** Kopf. **D** Fühler.

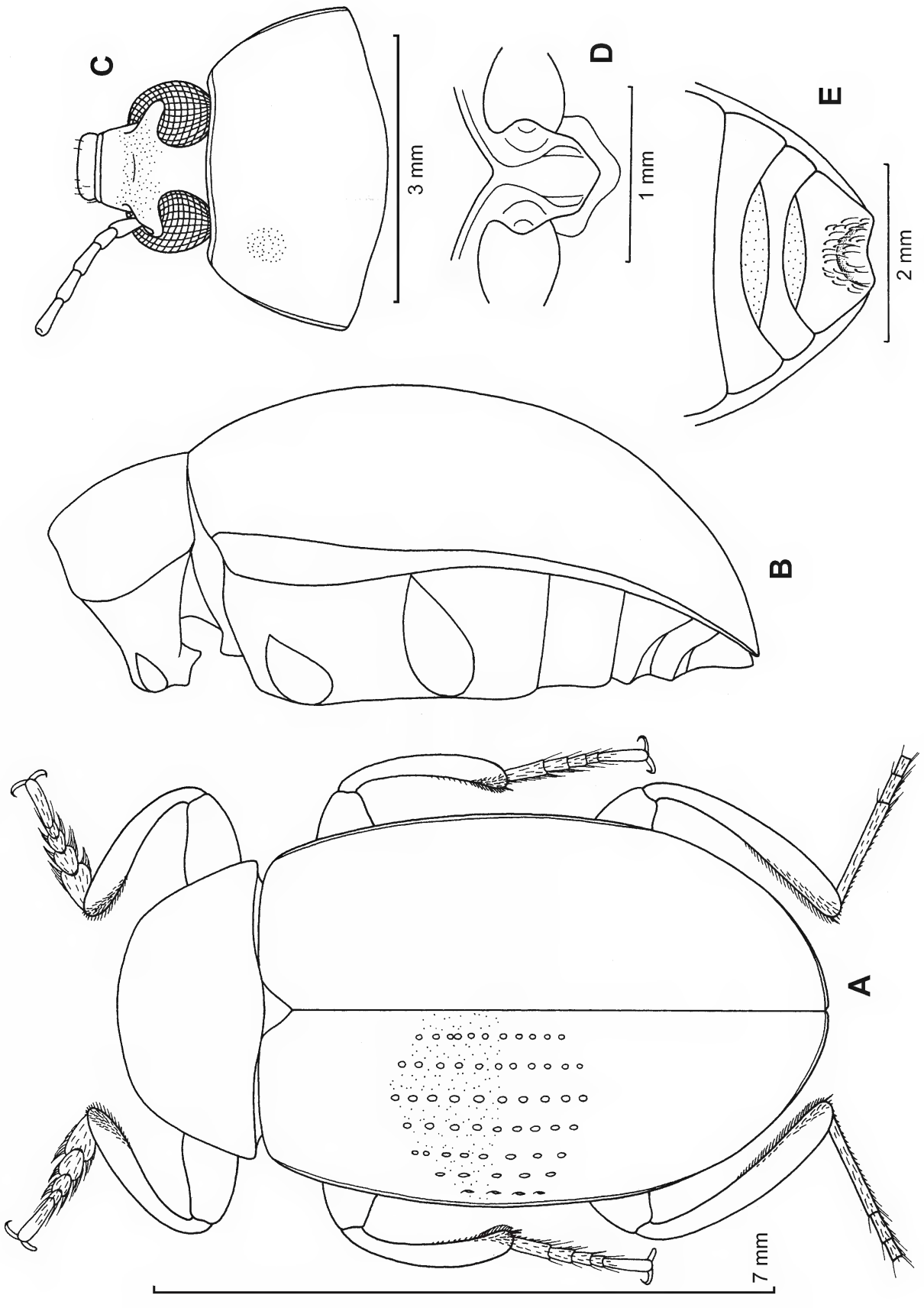


**Abb. 32.** *Amarygmus coloratus* (Kulzer, 1951). – **A** Habitus, ♂. **B** Körper lateral. **C** Kopf mit Fühlerrest von 5 Antennomeren und Halsschild. **D** Prosternalapophyse. **E** Sternite 3–5, ♂.

grünen und purpurfarbenen Längsstreifen, die breiter als die Interstitien und nicht strikt gerade sind. Protibiae kurz, apikad etwas kolbig aufgetrieben. – Sexualdimorphismus: Beim ♂ sind die Protarsomeren 1–3 in abnehmender Breite verbreitert. Sternit 5 beim ♂ apikomedian ausgeschnitten und leicht abgeschrägt, um den Ausschnitt herum lange, nahezu anliegende Haare; Intersegmentalmembranen zwischen den Sterniten verbreitert (zwischen Sternit 3 und 4 stark, zwischen 4 und 5 leicht), dadurch ist Sternit 4 sehr kurz. Femora beim ♂ ohne lange Haare.

Unter den Arten mit stark verbreiterten Protarsomeren bei den ♂♂ und Punktreihen auf den Flügeldecken haben *A. pulcher* (Kulzer, 1951) und *A. vicarius* n. sp. ebenfalls farbige Längsstreifen auf den Flügeldecken. *A. pulcher* weist engere Punkte in den Punktreihen der Flügeldecken auf; bei *A. vicarius* sind die Flügeldecken deutlich kürzer und breiter (siehe auch Bestimmungstabelle).

### Ergänzende Beschreibung

Maße (Holotypus): Länge 7,96 mm. Breite 3,98 mm. – Relationen: Breite/Länge des Halsschildes 1,81; Breite Hinterecken/Breite Vorderecken des Halsschildes 1,74. Länge/Breite der Flügeldecken 1,62; Länge Flügeldecken/Länge Halsschild 3,38; maximale Breite Flügeldecken/maximale Breite Halsschild 1,15.

## *Amarygmus cuprarius* ssp. *cuprarius* (Weber, 1801)

*Helops cuprarius* Weber, 1801: Weber (1801: 40).
*Amarygmus cuprarius* (Weber, 1801): Gemminger & de Harold (1870: 2023).
*Amarygmus iridipennis* Fairmaire, 1893 [Fairmaire (1893: 58)]: Bremer (2001b: 87) [syn.].
*Amarygmus callichromus* Fairmaire, 1897 [Fairmaire (1897: 70)]: Bremer (2001b: 87) [syn.].
*Amarygmus laosensis* Pic, 1922 [Pic (1922: 304)]: Bremer (2005b: 54) [syn.].

Nachbeschreibung mit Abbildungen und Angaben zu den Typen der verschiedenen Taxa, die von Java, Sumatra, Japan und Laos stammen, siehe Bremer (2005b: 54).

### Material

Philippines (1 MNHP). – Philipp. (1 MNHP). – Île Boac, Marinduque Prov., R. Lumawil leg. (29 MNHP). – Basilan (1 MNHP). – Samar, VI.–VII.1996, J. Whitehead (1 MNHP). – Luzon, Camarines Sur, 12 km N of Ocampo, 800 m, 25.–27.V.1996, Bolm leg. (9 SMNS). – N Luzon, Ilocos Norte Pr., Patapat Mts., N of Adams, 300 m, 18°30'N 120°55'E, 3.IV.2000, L. Dembický leg. (2 ZSMB). – Sibuyan Is., Romblon, Philippines (3 CA, 1 NHMB). – Mindoro, Mansalay, 22.VI.1971, R. E. Parrott (5 CAN).

### Diagnose

Große, flache, länglich ovale, glänzende Art. Flügeldecken mit Striae, die aus sehr dicht stehenden, mittelgroßen, verbundenen Punkten bestehen; Interstitien annähernd eben, sehr dicht und fein punktiert. Halsschild dicht und klein punktiert. Die etwas variable Stirn meist schmal. Fühler kurz. Prosternalapophyse breit, flach, apikal breit zugespitzt. Ausgezeichnet durch farbige Längsstreifen auf den Flügeldecken und farbig reflektierenden Halsschild; Grundfarbe meist grünlich.

*A. cuprarius* hat ein großes Verbreitungsgebiet (Nepal, nördliches Indien, Burma, Thailand, Laos, südliches China, Japan (Okinawa Inseln), Taiwan, Malayische Halbinsel, Große Sunda-Inseln, Kleine Sunda-Inseln, Sulawesi, Philippinen, südliche Molukken) und ist auch auf den Philippinen häufig.

Eine gewisse Ähnlichkeit in Gestalt und Färbung der Oberseite besteht mit *A. pulcher* (Kulzer, 1951). Zu den Unterschieden siehe bei dieser Art.

### Ergänzende Beschreibung

Maße: Länge 9,7–11,9 mm. – Relationen: Länge/Breite der Flügeldecken 1,43–1,56. Die Längen der Metatarsomeren 1–4 sind 39:12:8:25.

## *Amarygmus cyaneipennis* Pic, 1938

*Amarygmus micans* (Fabricius, 1794) var. *cyaneipennis* Pic, 1938: Pic (1938: 10).
*Amarygmus cyaneipennis* Pic, 1938: Bremer (2004a: 10) [stat. n.].

Nachbeschreibung und Abbildungen siehe Bremer (2004a: 20–22, 62).

### Material

Taiwan: Lan-Yu, Orchid Is., Formosa, 21.III.1981, K. Wada (7 CA, 3 ZSMB). — Philippinen: Island Sibuyan, Boku, *micans* var. *cyaneipennis* Pic, type, Muséum Paris Coll. M. Pic (2 Syntypen MNHP). – Philipp. Fitting (1 ZSM). – Philippines, N Luzon, Ilocos Norte Pr., Patapat Mts., N of Adams, 300 m, 18°30'N 120°55'E, 3.IV.2000, L. Dembický leg. (20 SMNS, 6 ZSMB). – Luzon, Camarines Sur, 12 km N of Ocampo, 800 m, 25.–27.V.1996, Bolm leg. (2 SMNS). – Asia Hot Spring, Baguio, Is. Luzon, 30.IV.1985, Jose Alanse leg. (3 CM). – Sibuyan Is., Romblon, Philippines (1 CA). – Mt. Caula-on [= Mt. Canlaon], Negros, Philippines, IV.2006, D. Mohagan leg. (19 CA, 6 ZSMB).

### Diagnose

Klein, länglich oval. Halsschild schmutzig grün oder blau. Flügeldecken blau, glänzend, ohne purpurne oder violette Reflexionen. Flügeldecken mit leicht eingedrückten Striae mit kleinen bis mittelgroßen, runden Punkten; Abstände dieser Punkte voneinander interindividuell variabel, zwischen dem 1- bis 3-fachen der Punktdurchmesser; Interstitien auf der Scheibe sehr leicht, seitlich etwas deutlicher aber trotzdem noch schwach gewölbt. Fühler ziemlich lang, zurückgelegt etwa die Mitte der Flügeldecken erreichend. Stirn mittelbreit. Protarsomeren bei den ♂♂ nicht verbreitert. Metasternum bei den ♂♂ nur gering behaart.

*A. cyaneipennis* ist von dem sehr ähnlichen *A. micans* (Fabricius, 1794) abzugrenzen, der ebenfalls auf den Inseln der Philippinen vorkommt. *A. micans* weist auf den Flügeldecken ausgedehnte violette oder purpurne Reflexionen auf und ist dadurch leicht von *A. cyaneipennis* zu unterscheiden. Die Striae auf den Flügeldecken sind bei *A. micans* etwas tiefer eingeschnitten als bei *A. cyaneipennis*, die runden Punkte in ihnen sind etwas kleiner, und das Metasternum ist bei den ♂♂ dicht, die Scheibe verdeckend behaart, die Haare lang, schräg aufragend (bei *A. cyaneipennis* finden sich auf dem Metasternum vorne nur wenige zarte, mittellange, die Scheibe nicht verdeckende Haare).

Eine ähnlich blaue Oberseite, Größe und Gestalt besitzt *A. platolenoides* n. sp.; diese Art ist durch die sehr stark verbreiterten Protarsomeren 1–3 bei den ♂♂ gekennzeichnet. Die vorletzten Antennomeren sind bei *A. platolenoides* wesentlich kürzer als bei *A. cyaneipennis*. Die Punkte in den Striae sind bei *A. cyaneipennis* größer als bei *A. platolenoides*, die Punktierung des Halsschildes und der Interstitien der Flügeldecken ist geringer ausgeprägt und das Analsternit ist bei den ♂♂ apikomedian nicht ausgeschnitten (bei *A. platolenoides* deutlich ausgeschnitten).

Sehr ähnlich ist auch *A. mendicus* n. sp. aus dem nördlichen Luzon (Körperlänge 4,36–4,75 mm). Diese Art besitzt einen schwarzblauen Halsschild und dunkel kupfrige Flügeldecken ohne farbige Reflexionen, die Antennomeren 7–11 sind kürzer als bei *A. cyaneipennis* und die Scheibe des Metasternums ist beim ♂ nur fein und schütter punktiert und unbehaart.

Ergänzende Beschreibung

M a ß e : Länge 4,4–5,5 mm. – Relationen: Länge/Breite der Flügeldecken 1,41–1,55. Die Längen der Metatarsomeren 1–4 sind 31:11:6:16.

## *Amarygmus elytralis* Bremer, 2001
(Abb. 33A–H)

*Platolenes striatus* Kulzer, 1951: Kulzer (1951: 552).
*Amarygmus striatus* (Kulzer, 1951): Bremer (2001a: 74) [nec *Amarygmus striatus* Macleay, 1872].
*Amarygmus elytralis* Bremer, 2001: Bremer (2001a: 74) [nom. n.].

Material

Imugan, Luzon, Philippinen (Böttcher) (Holotypus ♂ NHMBF; rechter Fühler nur mit den ersten 4 Antennomeren). Ein Etikett mit Genus- und Artnamen fehlt; ich habe deshalb ein gedrucktes Etikett hinzugefügt mit der Beschriftung: „Holotypus!, *Platolenes striatus* Kulzer, 1951 (=*Amarygmus elytralis* Bremer, 2001". – Mt. Isarog, Luzon, Philippinen (Böttcher) (Paratypus ♂ NHMBF; ohne Kopf, Vorder- und Mittelbeine). Ein Etikett mit Genus- und Artnamen fehlt, deshalb gedrucktes Etikett durch mich hinzugefügt: „Paratypus!, *Platolenes striatus* Kulzer, 1951 (=*Amarygmus elytralis* Bremer, 2001)". – Ich kenne von der Art nur diese beiden Exemplare.

Diagnose

Groß, länglich oval. Flügeldecken mit tief eingeschnittenen Striae, in denen längliche, eng stehende Erweiterungen als Punktäquivalente zu sehen sind; stark gewölbte Interstititien mit winzigen Punkten. Stirn ziemlich eng, etwas breiter als die Länge von Antennomer 2 (wie 6½:9). Protarsomeren 1–3 der ♂♂ stark verbreitert und verlängert, die Breite von 1 nach 3 deutlich abnehmend. Mesotarsomeren bei den ♂♂ etwas verbreitert und (wahrscheinlich) auch verlängert. Intersegmentalmembran bei den ♂♂ zwischen den Sterniten 3 und 4 verbreitert, dadurch Sternit 3 stark verkürzt. Analsternit der ♂♂ ohne strukturelle Besonderheiten. Fühler ziemlich dünn, zurückgelegt etwa das erste Drittel der Flügeldecken überlappend. Seitliche Querfurchen hinter den Metacoxae grob punktiert. Unterseite der ♂♂ kahl. Flügeldecken mit purpurnen und grünlichen Längsstreifen, die sich nicht ganz mit den Interstitien decken; Halsschild und Stirn braun; Unterseite und Femora schwarzbraun bis braun; Tibiae braun.

Diese Art ist mit keiner anderen Art zu verwechseln.

Ergänzende Beschreibung

M a ß e (Holotypus): Länge 11,1 mm. Breite 5,7 mm. – Relationen: Breite/Länge des Halsschildes 1,67; Breite Hinterecken/Breite Vorderecken des Halsschildes 1,67. Länge/Breite der Flügeldecken 1,53; Länge Flügeldecken/Länge Halsschild 3,67; maximale Breite Flügeldecken/maximale Breite Halsschild 1,44. Die Längen und Breiten der Antennomeren 1–11 verhalten sich wie 12:6½ / 6½: 4½ / 23:4½ / 16:5 / 16:5 / 18:5 / 17:6 / 15:7½ / 13:8 / 13:8 / 16:9. Die Längen der Protarsomeren 1–5 sind 17:13:8:4:20, die der Mesotarsomeren 1–5 sind 21:16:10:5:23, die der Metatarsomeren 1–4 sind 41:16:9:26.

## *Amarygmus fragilis* Bremer, 2001

*Amarygmus fragilis* Bremer, 2001: Bremer (2001c: 5).

Material

Philippinen, Tawi Tawi [Sula Archipel], Tarawakan, north of Batu Batu, 25.X.1951, *Amarygmus* sp., Kaszab det. (Holotypus TTM; Geschlecht nicht untersucht, aber wahrscheinlich ein ♂).

Diagnose

Winzige, ovale, stark gewölbte Art. Ausgezeichnet auf den Flügeldecken durch Punktreihen mit kleinen Punkten, die weit voneinander stehen und im Apikalbereich verlöschen (in der 4. Reihe etwa 18 Punkte); Interstitien absolut plan, unpunktiert. Halsschild unpunktiert. Stirn sehr breit (Breite entspricht der gemeinsamen Länge der Antennomeren 3–5). Stirnnaht tief eingeschnitten. Clypeus sehr

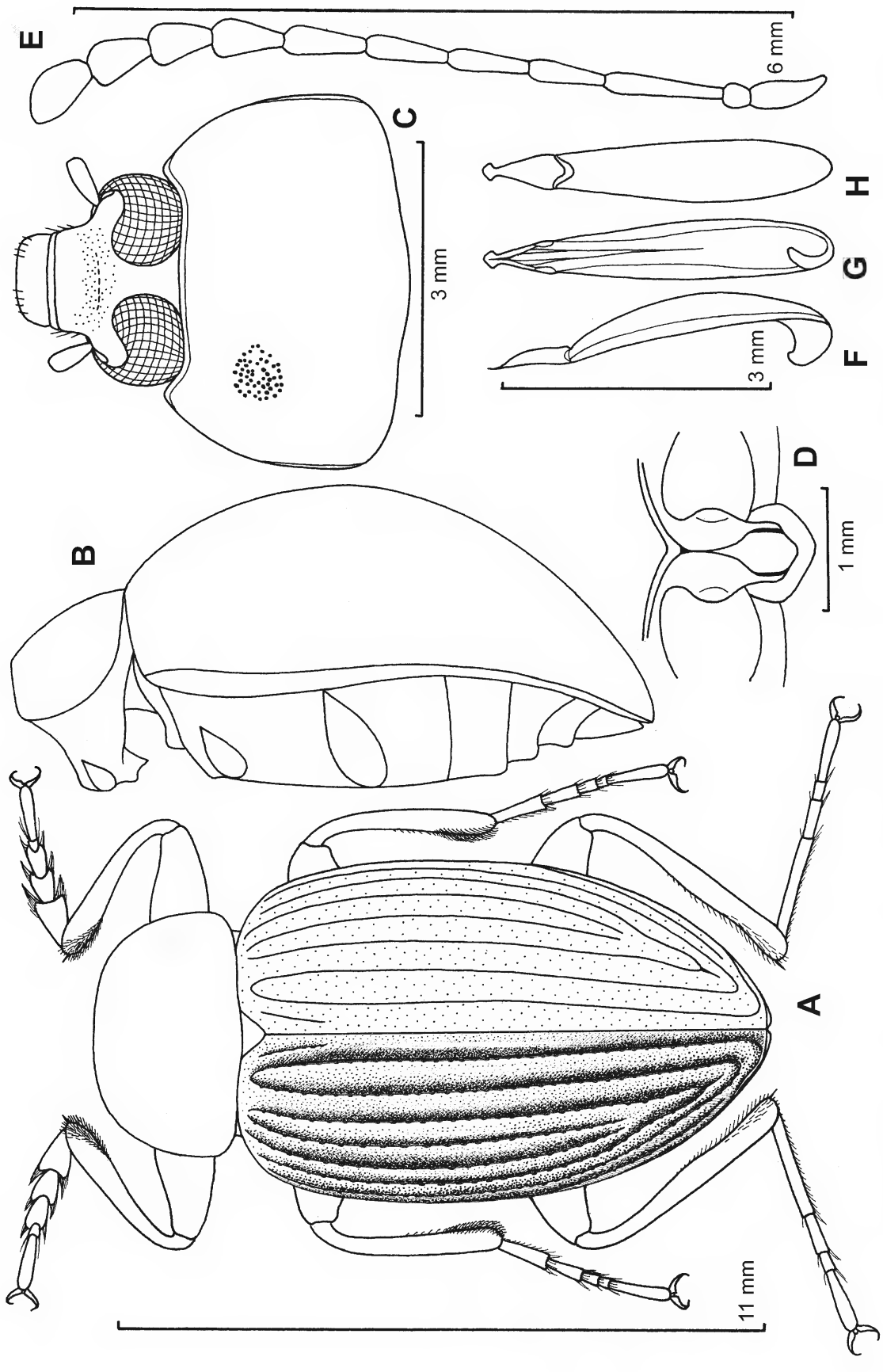


**Abb. 33.** *Amarygmus ebytralis* Bremer, 2001. – **A** Habitus. **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Fühler. **F** Aedoeagus lateral. **G** Aedoeagus ventral. **H** Aedoeagus dorsal.

kurz. Metasternum neben der Mediannaht mit kleinen, weit auseinander stehenden Punkten mit kurzen, nach hinten geneigten Haaren.

Diese winzige, zerbrechlich aussehende Art ähnelt wegen der tief eingeschnittenen Clypealsutur, der Farbe, der Größe und der deutlichen Punktreihen der Flügeldecken in Kombination mit den wenig punktierten Interstitien *A. straumanni* Bremer, 2001 von Borneo. *A. straumanni* besitzt einen gemeinsamen, bogenförmigen Abschluss von Stirn und Wangen gegenüber der furchenartigen Stirnnaht (bei *A. fragilis* ist dieser Abschluss gerade). Bei allen anderen, mir bekannten Arten der Gattung *Amarygmus* gibt es wohl Arten, bei denen die Stirnnaht deutlich eingeschnitten ist, aber sonst keine, die eine tiefe, durchgehende Furche an der Stelle der Stirnnaht, verbunden mit einem sehr kurzen Clypeus, aufweist. Ähnlich sieht auch *A. niasensis* (Pic, 1915) von den Großen Sunda-Inseln und der Malayischen Halbinsel aus, der aber keine sehr stark eingeschnittene Stirnnaht aufweist.

### Ergänzende Beschreibung

F a r b e : Halsschild und Stirn grünblau. Flügeldecken grüngolden, stark glänzend. Clypeus dunkelbraun. Die ersten 6 Antennomeren gelbbraun, die restlichen zunehmend dunkel; gegenüber den dunklen Antennomeren kontrastieren einzelne gelbe, abstehende Haare. Mentum und Palpen gelbbraun, Halsunterseite dunkelbraun. Unterseite dunkelbraun, glänzend. Femora wie die Unterseite, Tibiae etwas heller. Kopfoberseite matt.

M a ß e : Länge 2,86 mm. Breite 1,90 mm. – Relationen: Breite/Länge des Halsschildes 2,00; Breite Hinterecken/Breite Vorderecken des Halsschildes 1,71. Länge/Breite der Flügeldecken 1,23; Länge Flügeldecken/Länge Halsschild 3,08; maximale Breite Flügeldecken/maximale Breite Halsschild 1,25.

F ü h l e r : Lang. Die Längen und Breiten der Antennomeren 1–11 verhalten sich wie 12:5 / 7:4 / 11:4 / 6:4 / 6:4 / 9:6 / 9:6 / 9:7 / 9:7 / 9:7 / 14:9.

B e i n e : Relativ kurz. Pro- und Mesotibiae gerade, Metatibiae etwas gebogen. Die Längen der Metatarsomeren 1–4 sind 21:9:5:12.

## *Amarygmus inversus* Bremer, 2005 (Abb. 34A–H)

*Platolenes rufipes* Gebien, 1913: Gebien (1913: 421).
*Amarygmus rufipes* (Gebien, 1913): Bremer (2001a: 57) [nec *Amarygmus rufipes* Macleay, 1872].
*Amarygmus inversus* Bremer, 2005: Bremer (2005a: 211) [nom. n.].

Die Beschreibung von Gebien ist zitiert in Bremer (2001e: 289).

### Material

Philippin., Benguet, Bued River (H. M. Curram), Acc. No. 9882, Lot, Bu. of Sci., P. I., *Platolenes rufipes* n. sp., H. Gebien det., *Platolenes rufipes* Geb., Type No. 354 (Holotypus ♂ NHMBF). – Mt. Santo Tomas, North Luzon, 8.IV.1976, T. Mizunuma leg. (1 ♂ CM, 1 ♀ CM, 1 ♀ ZSMB). – Philippinen, Luzon, Prov. Bontoc, Chatol, 15 km E Bontoc, 1800 m, 24.VII.1993, LF, leg. Mario Graul (2 ♀♀ CL, 1 ♂ ZSMB). – Philippinen, Prov. Bontoc, Pinantew, 10 km E Bontoc, 1900 m, 2.VIII.1993, LF, leg. Mario Graul (1 ♀ CL). – Mt. Pangao, Bontoc Prov., Luzon, Philippines, 31.V.1977, Y. Kurosawa (1 ♀ CM).

### Diagnose

Mittelgroße, länglich ovale Art, mit längs und quer nur gering gewölbten Halsschild und Flügeldecken. Punktreihen der Flügeldecken mit kleinen bis mittelgroßen, wenig markierten Punkten (etwa 24 Punkte in der 4. Reihe); Interstitien mit etwas unruhiger Oberfläche und feinen, schütter stehenden Punkten. Halsschild sehr breit, sehr fein punktiert. Stirn breit, bei beiden Geschlechtern etwa gleich breit, breiter als die gemeinsamen Länge der Antennomere 3 und 4 (wie 24:21). Oberseite des Kopfes eben, nur sehr fein und unauffällig punktiert. Stirnnaht nicht eingeschnitten oder eingedrückt. Wangen nur sehr gering gewölbt. Fühler lang, Antennomeren gut voneinander separiert. Vor der Prosternalapophyse ist die aufgebogene Randung der Vorderseite breit unterbrochen; dort zieht ein breiter, flacher Kiel kurz in die Apophyse hinein. Neben den Hüften sind die Seiten deutlich laterad verbreitert, zwischen ihnen eine breite, angedeutete Furche; hinter den Hüften ist die Apophyse deutlich herabgebogen, apikal breit verrundet, apikomedian kaum angehoben. Vorne auf dem Metasternum einige kleine, weitläufig stehende Punkte. Sternite mikroretikuliert, matt, kaum punktiert. Besonders ausgezeichnet durch die sehr breiten Protarsomeren 1–3 bei den ♂♂ und durch die Unterschiede zwischen den Farben der Ober- und Unterseite sowie denen der Femora und Tibiae.

Ist besonders mit *A. latipes* (Kulzer, 1951) zu vergleichen. Die Unterschiede sind bei dieser Art aufgeführt.

### Ergänzende Beschreibung

M a ß e : Länge 7,64–9,48 mm. Breite 3,75–4,78 mm. – Relationen: Breite/Länge des Halsschildes 1,97–2,19; Breite Hinterecken/Breite Vorderecken des Halsschildes 1,78–1,84. Länge/Breite der Flügeldecken 1,60–1,76; Länge Flügeldecken/Länge Halsschild 4,26–4,52; maximale Breite Flügeldecken/maximale Breite Halsschild 1,22–1,35.

F a r b e : Flügeldecken dunkelgrün, gering glänzend. Halsschild grün mit deutlich purpurnen Reflexionen, stark glänzend. Unterseite schwarz. Femora und Tibiae rotbraun.

B e i n e : Protarsomeren 1–3 der ♂♂ stark verbreitert und verlängert. Die Längen der Protarsomeren 1–5 bei einem ♂ sind 12:9:7:6½:22, die der Metatarsomeren 1–4 sind 31:14:7:26; bei einem ♀ sind die Längen der Protarsomeren 7:5½:5:4:22.

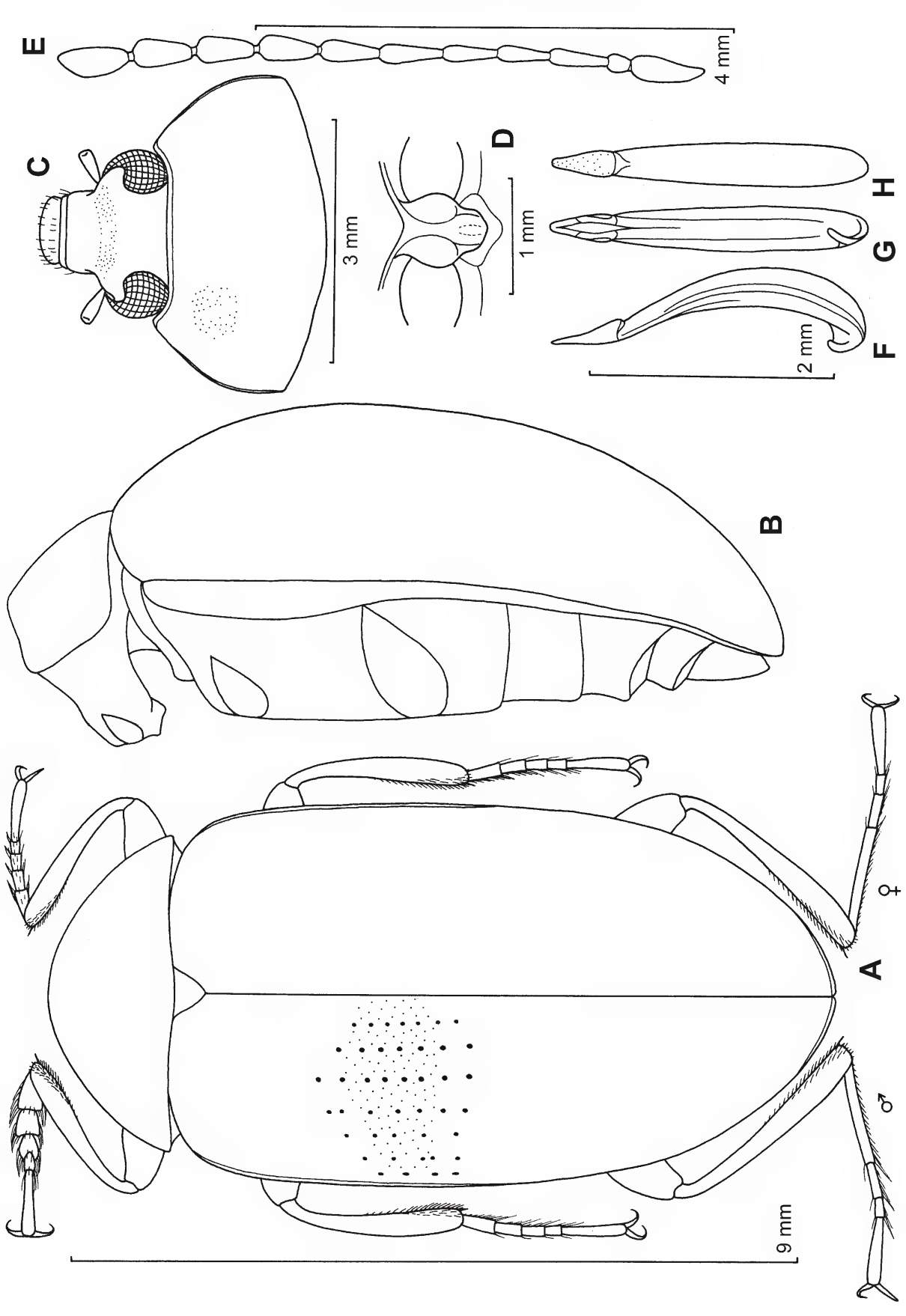


**Abb. 34.** *Amarygmus inversus* Bremer, 2005. – **A** Habitus; linksseitig Beine ♂, rechtsseitig Beine ♀. **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Fühler. **F** Aedoeagus lateral. **G** Aedoeagus ventral. **H** Aedoeagus dorsal.

## *Amarygmus latipes* (Kulzer, 1951) (Abb. 35A–H)

*Platolenes latipes* Kulzer, 1951: Kulzer (1951: 547).
*Amarygmus latipes* (Kulzer, 1951): Bremer (2001a: 57).

Die ausführliche Originalbeschreibung von Kulzer ist zitiert in Bremer (2001e: 238).

### Material

Island Samar, Baker, *Platolenes latipes* Klzr., det. H. Kulzer 1951 (Holotypus ♂ NHMBF). – Gleiche Funddaten wie Holotypus (Allotype ♀ NHMBF). – Surigao, Mindanao, Baker, *Platolenes latipes* Klzr., det. H. Kulzer 1951 (1 ♂ NHMB). – Zamboanga, Mindanao, Philippine Is., C. F. Baker, 1919-207 (1 ♂, 1 ♀ NHM). – Philippines, Tagutano, 1000 m, Mindanao, 25.–26.VI.1977, M. Sato (1 ♀ CM). – Mt. Apo, Mindanao, 12.–18.V.1978, T. Mizunuma leg. (1 ♀ CM, 1 ♀ ZSMB).

### Diagnose

Mittelgroße, länglich ovale Art mit farbiger Oberseite. Flügeldecken mit Punktreihen mittelgroßer bis großer, nicht verbundener Punkte, die in einigem Abstand voneinander positioniert sind; Interstitien eben, mit winzigen, schütter stehenden Punkten. Stirn breit, beim ♀ etwas breiter als bei den ♂♂. Protarsomeren der ♂♂ mit sehr breiten und verlängerten Tarsomeren 1–3. Fühler lang. Prosternalapophyse von mittlerer Breite; median zwischen den Hüften mit einer breiten, flachen Furche, hinter den Hüften etwas herabgebogen, apikomedian mit einer kurzen, nicht sehr hohen Erhebung. Vordere Querfurchen hinter den Mesocoxae punktiert. Vorderer Bereich des Metasternums ohne große Punkte. Sternite mit winzigen, sehr weitläufig stehenden Pünktchen. Bei den ♂♂ keine langen Haare an den Meso- oder Metafemora, aber mit starker Verbreiterung der Membranen zwischen den Sterniten 3–5, wodurch die Sternite 3 und 4 verkürzt sind. Analsternit der ♂♂ apikomedian abgeschrägt und apikal etwas ausgeschnitten.

Die Färbung der Oberseite kann interindividuell verschieden sein, ebenso die Größe und der Abstand der Punkte in den Reihen auf den Flügeldecken, so dass ich zunächst dachte, verschiedene Arten vor mir zu haben. Eine gewisse Ähnlichkeit hinsichtlich Größe, Sexualdimorphismus und Farbe besteht mit *A. inversus* Bremer, 2005. Die Querwölbung von Halsschild und Flügeldecken ist bei *A. latipes* ausgeprägter als bei *A. inversus*, ebenso die Längswölbung der Flügeldecken, *A. latipes* besitzt stärker gebogene Seiten der Flügeldecken, die Punkte der Punktreihen der Flügeldecken sind größer und besser markiert, das Grün der Flügeldecken ist heller, der Halsschild ist schmaler, stärker gewölbt und stärker punktiert, die Stirn ist schmaler und die Femora und Tibiae sind schwarz (bei *A. inversus* ebenso wie die Fühler hellbraun).

### Ergänzende Beschreibung

M a ß e : Länge 8,04–9,32 mm. Breite 3,90–4,78 mm. – Relationen: Breite/Länge des Halsschildes 1,73–1,93; Breite Hinterecken/Breite Vorderecken des Halsschildes 1,75–1,88. Länge/Breite der Flügeldecken 1,58–1,69; Länge Flügeldecken/Länge Halsschild 3,62–4,04; maximale Breite Flügeldecken/maximale Breite Halsschild 1,25–1,33. Die Längen der Metatarsomeren 1–4 sind 29:9:5:16.

F a r b e : Farbe der Oberseite sehr variabel; man findet Tiere mit einheitlich grüner Oberseite, daneben Exemplare mit einheitlich hell violetter Oberseite und solche (am Mt. Apo) mit glänzend blaugrünem Halsschild und messingfarbenen Flügeldecken. Unterseite, Femora und Tibiae schwarz. Tarsen braun. Fühler dunkelbraun bis schwarz.

## *Amarygmus longitarsis* Gebien, 1921 (Abb. 36A–H)

*Amarygmus longitarsis* Gebien, 1921: Gebien (1921: 493–494).

### Material

Philipp. I., Mt. Banahao (C. Baker), Typus No. 1080, *Amarygmus longitarsis* Gb. [Gebiens Handschrift] (Holotypus ♀ NHMBF). – Philippinen, Luzon, Montalban, leg. Böttcher (1 NMHUB). – Island Samar, Baker, *Amarygmus longitarsis* Gb. [Gebiens Handschrift] (1 NHMBF). – Luzon, Los Baños, Philippines, 19.IV.1981, M. Tao leg. (2 ♀♀ CM). – Philippines, Luzon, Mt. Banahao, 20.V.–20.VI.1998, leg. L. Mohagan (1 ♂ ZSMB).

### Diagnose

Von mittlerer Größe, oval, für *Amarygmus*-Arten wenig gewölbt. Oberseite braun metallisch. Flügeldecken länglich oval, quer und längs nicht sehr stark gewölbt, größte Breite und Höhe etwas vor der Mitte, mit Striae und kleinen Punkten; Interstitien auf der Scheibe sehr leicht gewölbt und mit feinen, ziemlich dicht stehenden Punkten. Stirn bei beiden Geschlechtern schmal, etwa so breit wie die Länge des 2. Antennomers. Vorderer Bereich vom Metasternum mit mittelgroßen, ziemlich dicht stehenden Punkten, dahinter mit kleinen, ziemlich dicht stehenden Punkten, beim ♂ kahl. Fühler lang, dünn. Metatarsen auffallend lang und dünn. Protibiae annähernd gerade. Mesotibiae sehr leicht gekrümmt. Metatibiae in der basalen Hälfte annähernd gerade, in der apikalen Hälfte sehr leicht einwärts gekrümmt. Protarsomeren 1–3 beim ♂ nicht verbreitert.

Entgegen der Beschreibung von Gebien ist die gesamte Oberseite nicht matt, sondern die Flügeldecken glänzen mehr oder weniger deutlich.

*A. longitarsis* gehört durch die Gestalt und den Sexualdimorphismus in die Nähe von *A. spectabilis* (Gebien,

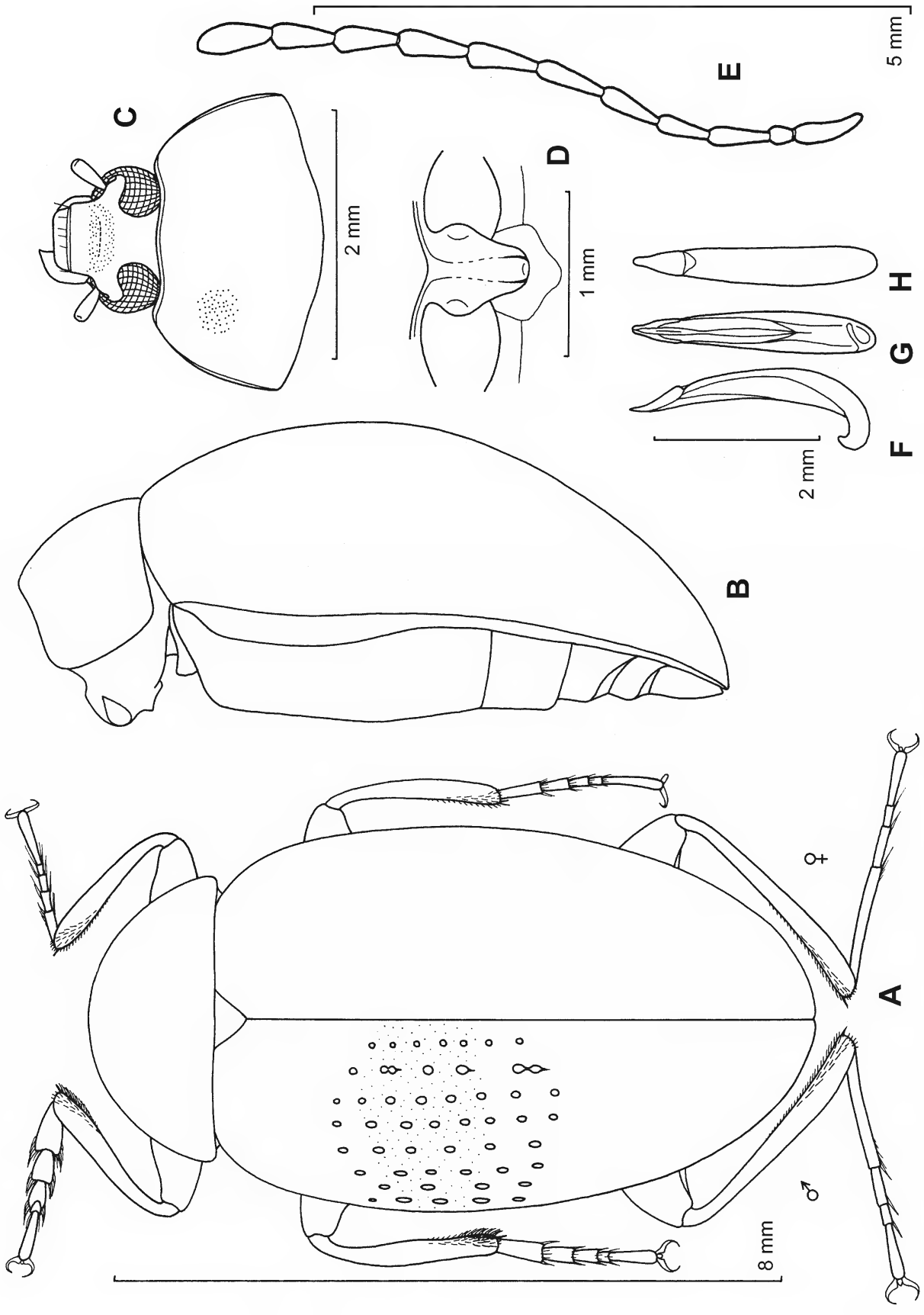


**Abb. 35.** *Amarygmus latipes* (Kulzer, 1951). – **A** Habitus; linkssеitig Beine ♂, rechtsseitig Beine ♀. **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Fühler. **F** Aedoeagus lateral. **G** Aedoeagus ventral. **H** Aedoeagus dorsal.

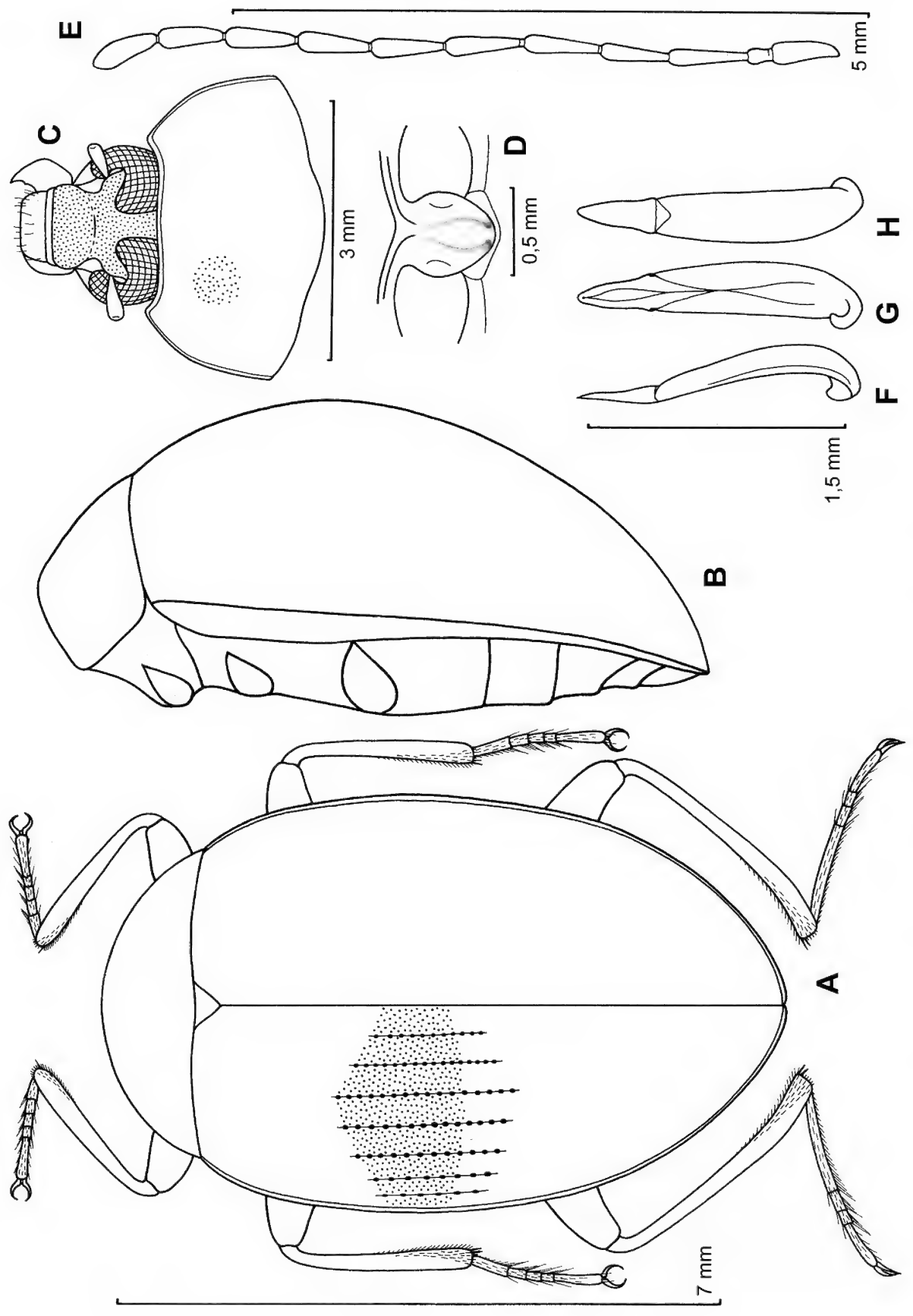


**Abb. 36.** *Amarygmus longitarsis* Gebien, 1921. – **A** Habitus, ♂. **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Fühler. **F** Aedoeagus lateral. **G** Aedoeagus ventral. **H** Aedoeagus dorsal.

1921); innerhalb dieser Gruppe steht er besonders *A. negrosensis* n. sp. nahe. *A. negrosensis* ist größer als *A. longitarsis* (Körperlänge 8,92–9,55 mm), die Flügeldecken sind länglicher (Länge/Breite der Flügeldecken bei *A. negrosensis* 1,46–1,48, bei *A. longitarsis* 1,39–1,43), die Prosternalapophyse ist apikal eckig (bei *A. longitarsis* verrundet), das Metasternum weist bei den ♂♂ eine ziemlich dichte Behaarung mit mittellangen Haaren auf (bei *A. longitarsis* kahl) und die Punktierung der Sternite 1+2 ist wesentlich dichter. – Die Stirn des ähnlich großen *A. abiectus* n. sp., ebenfalls von Luzon, ist wesentlich breiter als die Stirn von *A. longitarsis*.

### Ergänzende Beschreibung

Maße: Länge 7,40–7,88 mm. Breite 4,34–4,62 mm. – Relationen: Breite/Länge des Halsschildes 1,95–2,00; Breite Hinterecken/Breite Vorderecken des Halsschildes 1,80–1,91. Länge/Breite der Flügeldecken 1,39–1,43; Länge Flügeldecken/Länge Halsschild 3,62–3,75; maximale Breite Flügeldecken/maximale Breite Halsschild 1,32–1,33. Die Längen der Protarsomeren 1–5 sind beim ♂ wie 6:5:4:3:14, die der Metatarsomeren 1–4 sind 26:7:4:14.

Farbe: Oberseite braun metallisch. Halsschild deutlich mikroretikuliert, matt. Flügeldecken nicht mikroretikuliert, mehr oder weniger glänzend. Beine und Fühler braun. Unterseite braun. Metasternum glänzend, Sternite matter als Metasternum.

## *Amarygmus metallicus* (Perty, 1831) (Abb. 37A–H)

*Cnodalon metallicum* Perty, 1831: Perty (1831: 41).
*Amarygmus metallicus* (Perty, 1831): Guérin-Méneville (1832: 102).

a. *Dietysus amplicollis* Fairmaire, 1886: Fairmaire in Baert (1886: 189).
*Amarygmus amplicollis* (Fairmaire, 1886): Gebien (1944: 502).
*Amarygmus amplicollis* (Fairmaire, 1886): Bremer (2001b: 87) [syn.].

b. *Dietysus anthracinus* Fairmaire, 1893: Fairmaire (1893: 60).
*Amarygmus anthracinus* (Fairmaire, 1893): Gebien (1927: 50) [syn.].

c. *Dietysus celebensis* Pic, 1915: Pic (1915b: 48).
*Amarygmus celebensis* (Pic, 1915): Gebien (1944: 506).
*Amarygmus celebensis* (Pic, 1915): Bremer (2001d: 164) [syn.].

d. *Dietysus confusus* Pascoe, 1866: Pascoe (1866: 486).
*Amarygmus confusus* (Pascoe, 1866): Gebien (1920: 410).
*Amarygmus confusus* (Pascoe, 1866): Gebien (1920: 410) [syn.].

e. *Amarygmus lilligi* Bremer, 2001.
*Dietysus niger* Pic, 1915: Pic (1915b: 48).
*Amarygmus niger* (Pic, 1915): Gebien (1944: 504) [Homonym].
*Amarygmus lilligi* Bremer, 2001: Bremer (2001a: 72) [nom. n.].
*Amarygmus lilligi* Bremer, 2001: Bremer (2001d: 164) [syn.].

f. *Dietysus longicrus* Fairmaire, 1882: Fairmaire (1882: 250).
*Amarygmus longicrus* (Fairmaire, 1882): Gebien (1944: 503).
*Amarygmus longicrus* (Fairmaire, 1882): Bremer (2001b: 87) [syn.].

g. *Dietysus luzonicus* Fairmaire, 1886: Fairmaire in Baert (1886: 189).
*Amarygmus luzonicus* (Fairmaire, 1886): Gebien (1944: 503).
*Amarygmus luzonicus* (Fairmaire, 1886): Bremer (2001b: 87) [syn.].

h. *Dietysus nitidior* Pic, 1951: Pic (1951: 15).
*Amarygmus nitidior* (Pic, 1951): Bremer (2001a: 57)
*Amarygmus nitidior* (Pic, 1951): Bremer (2001b: 87) [syn.].

i. *Dietysus palawanus* Pic, 1951: Pic (1951: 15).
*Amarygmus palawanus* (Pic, 1951): Bremer (2001a: 57).
*Amarygmus palawanus* (Pic, 1951): Bremer (2001b: 87) [syn.].

Nachbeschreibung und Angaben zu den Typen der verschiedenen Taxa siehe Bremer (2001d: 164–166).

### Material

*A. metallicus* (Perty) kommt wahrscheinlich auf allen Inseln der Philippinen vor. Tiere von folgenden Fundorten haben mir vorgelegen:

Luzon: Typus von *Dietysus luzonicus* Fairmaire, 1886 (MNHP). – N Luzon, Cap Engano (1 NHMB). – Imugin, N. Vizcaya (1 NHMB). – Manila (1 NHMB). – Manila (1 UNVS). – Lagunas, Mt. Makilin, 600 m (16 NHMG, 2 ZSMB). – Pagbilao Prov., Quezon Nat. Park (1 SMNS, 1 NHMB). — Palawan: Typus von *Dietysus nitidior* Pic, 1951 (MNHP). – Port Barton, 150 m (1 NHMBF). – Island Polillo (2 NHMBF). — Panay: NW Panay (1 NHMBF). — Samar: Island Samar (4 NHMBF). — Sibuyan: Island Sibuyan (2 NHMBF). — Negros: Mt. Caula-on [= Mt. Canlaon] (8 CA). — Cebu: Cebu, San Carlos (2 NHMB). — Leyte: Tangcolan, Bukitnon [= Bukidnon] (2 NHMB). — Mindanao: Surigao (5 NHMBF). – 30 km E of Malaybalay, Busdi, 1000 m (2 SMNS). – Misamis occ. (9 SMNS). — Mindoro: Mansalay (2 CAN).

Weiteres Vorkommen: Südliches Thailand; Malayische Halbinsel; Sumatra; Java; Borneo; Sulawesi; Ceram; Ambon, Saparua (Molukken).

### Diagnose

Länglich oval. Flügeldecken mit gering eingeschnittenen Striae, in denen sehr eng kleine Punkte stehen; Enden der Flügeldecken etwas vorstehend und verrundet zur Flügeldeckennaht hin eingezogen. Halsschild nur gering gewölbt, in der hinteren Hälfte etwas variabel in der Form (Seiten entweder subparallel oder etwas nach hinten eingezogen). Stirn nicht sehr breit. Fühler lang. Beine lang. Metatibiae der ♂♂ meist etwas abgeknickt. Protarsomeren 1–3 der ♂♂ nicht verbreitert. Prosternalapophyse schmal. Spitze des Aedoeagus leicht dorsad gebogen.

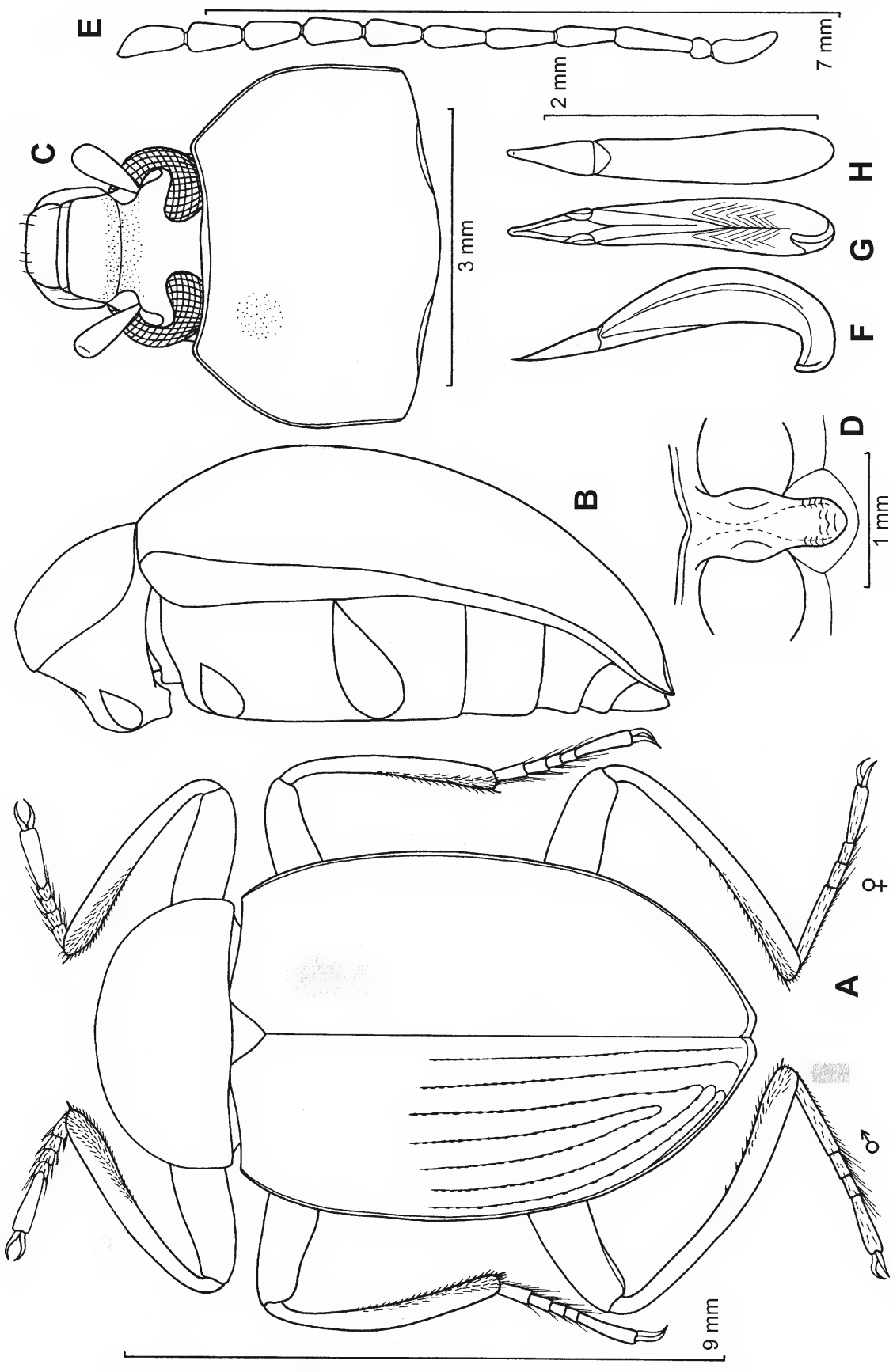


**Abb. 37.** *Amarygmus metallicus* (Perty, 1831). – **A** Habitus; linksseitig Beine ♂, rechtsseitig Beine ♀. **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Fühler. **F** Aedoeagus lateral. **G** Aedoeagus ventral. **H** Aedoeagus dorsal.

Oberseite meist schwarz, mit metallischem Schein, stark glänzend. Unterseite, Beine und Fühler schwarz.

Sehr ähnlich und von ähnlicher Größe und Gestalt ist *A. pertyi* Bremer, 2001 aus Luzon und Boac. Die Flügeldeckenenden dieser Art sind ebenso wie bei *A. metallicus* etwas vorgezogen und zur Flügeldeckennaht hin eingezogen, und die Fühler sind bei beiden Arten gleichlang. Zu den Unterschieden siehe bei *A. pertyi*. – Eine gewisse Ähnlichkeit besitzt auch *A. pseudometallicus* n. sp. aus Mindanao; bezüglich der Unterschiede siehe bei dieser Art.

### Ergänzende Beschreibung

Maße: Länge 9,5–12,1 mm. Breite 4,7–5,8 mm. – Relationen: Länge/Breite der Flügeldecken 1,44–1,53. Die Längen der Metatarsomeren 1–4 sind 41:13:10:33.

### Anmerkung

Diese Art ist in niedrigen Höhenlagen unter verpilztem Holz am Boden meist häufig zu finden.

## *Amarygmus micans* (Fabricius, 1794)

*Chrysomela micans* Fabricius, 1794: Fabricius (1794: 447).
*Amarygmus micans* (Fabricius, 1794): Dalman (1823: 60).

a. *Amarygmus fulgiditessellatus* Blanchard, 1853 [Blanchard (1853: 179)]: Gebien (1911: 577) [syn.].
b. *Amarygmus variicolor* Fairmaire, 1893 [Fairmaire (1893: 59)]: Gebien (1911: 578) [syn.].
c. *Amarygmus reductecupreus* Pic, 1952 [Pic (1952: 2)]: Bremer (2001b: 85) [syn.].
d. *Amarygmus apicalis* Pic, 1915 [Pic (1915a: 240)]: Bremer (2005b: 49) [syn.].

Nachbeschreibung mit Abbildungen und Angaben zu den Typen der synonymen Taxa siehe Bremer (2005b: 49–51). In der genannten Arbeit wurde ein Lectotypus von *Chrysomela micans* Fabricius festgelegt, da die drei Syntypen von *Chrysomela micans* Fabricius im ZMK zu zwei verschiedenen Arten gehörten.

### Material

Bei *A. micans* handelt sich um eine sehr häufige Art mit einem sehr großen Verbreitungsareal, das von Thailand bis zu den Marianen-Inseln des Pazifiks reicht.

Fundorte von den Philippinen: Iligan, Mindanao, Baker (1 ZSM). – Zamboanga, Mindanao, Baker (1 ZSM). – Leyte, SW Abuyog (5 SMNS, 2 ZSMB). – Mindanao, 30 km SW of Bislig (1 CM). – Leyte, Visca N Baybay, sec. Forest (10 SMNS, 2 ZSMB). – Leyte, VIII.98, Whitehead (2 MNHP).

### Diagnose

Klein, länglich oval, stark gewölbt. Flügeldecken mit eingeschnittenen Striae, in denen sich schmale, mittelgroße, längliche Punkte finden; Interstitien leicht gewölbt, mit feinen Punkten. Halsschild blaugrün. Besonders charakterisiert durch intensive, großflächig purpurne oder violette Reflexionen auf den Flügeldecken. Beine und Fühler schwarzbraun bis schwarz. Stirn relativ schmal. Fühler ziemlich lang. Metasternum der ♂♂ in den hinteren drei Fünftel sehr dicht behaart. Protarsomeren 1–3 der ♂♂ sehr leicht verbreitert.

Auf den Philippinen findet sich sympatrisch ein Taxon, das sehr ähnlich dem *A. micans* ist und welches Pic (1938) als *Amarygmus micans* var. *cyaneipennis* beschrieben hat. Es ist auf der Oberseite blau bis blaugrün, ihm fehlen die brillanten purpurnen Reflexionen und es hat in den Striae etwas größere Punkte als *A. micans*. Die Behaarung des Metasternums bei den ♂♂ ist im Gegensatz zu denen von *A. micans* gering. Ich betrachte dieses Taxon deshalb als selbständige Art (siehe unter *A. cyaneipennis*).

Ein weitere Art nahe *A. micans* von den Philippinen ist *A. mendicus* n. sp. Letztere Art besitzt einen schwarzblauen Halsschild und dunkel kupfrige Flügeldecken, sie ist etwas kleiner (Körperlänge 4,36–4,75 mm), die Scheibe des Metasternums ist beim ♂ nicht dicht behaart und die Antennomeren 7–11 sind etwas kürzer.

### Ergänzende Beschreibung

Maße: Länge 4,90–5,95 mm. Breite 2,53–3,20 mm. – Relationen: Länge/Breite der Flügeldecken 1,38–1,55. Die Längen der Metatarsomeren 1–4 sind 48:18:9:24.

## *Amarygmus pertyi* Bremer, 2001 (Abb. 38A–K)

*Amarygmus pertyi* Bremer, 2001: Bremer (2001d: 166–168).

### Material

N Luzon, 750 m, Kalinga-Apayao Pr., Cordillera Centr., Saltan upper valley, 17°30'N 121°08'E, 22.III.2000, L. Dembický leg. (Holotypus ♂ SMNS). – Kalinga-AP/Abra Pr. boundary, Cordillera Centr., around Pass at 1600 ± 100 m, 17°30'N 121°00'E, 26.–28.III.2000, L. Dembický leg. (Paratypen 5 ♀♀ SMNS, 2 ♀♀ ZSMB). – Ilocos Norte Pr., Patapat Mts., N of Adams, 300 m, 18°30'N 120°55'E, 3.IV.2000, L. Dembický leg. (1 ♂, 1 ♀ Paratypen SMNS). – Luzon, Mt. Banahao, 20.V.–20.VI.1998, leg. L. Mohagan (Paratypus TTM). – Bangui, N Luzon, Coll. P. Ardoin 1978, *Dietysus luzonicus* (Paratypus ♂ MNHP). – Bangui, N Luzon (Paratypus NHMB). – Laguna, Mt. Makeling, *Amarygmus luzonicus* Frm. [Gebiens Handschrift] (Paratypus ♂ TTM). – Marinduque Prov., Île Boac, Îles Philippines, XI.1972, R. Ludewig leg., Muséum Paris, Coll. P. Ardoin (Paratypus ♂ MNHP). – S Luzon, Quezon N.P. (Lucena), 250 m, 8.–10.I.1991, Bolm leg. (Paratypus ♀ NHMB). – Nueva Vizcaya, Bayombong (1 NHMBF). – Bangui (1 NMHUB).

Anmerkung: Diese Art scheint endemisch für Luzon und Boac zu sein.

### Diagnose

Groß, längs und quer ziemlich flach. Flügeldecken langgestreckt oval (größte Breite bei den ♀♀ weiter hinten als bei den ♂♂, etwa am Übergang zum hinteren Drittel). Seitenrandkanten der Flügeldecken in der ganzen

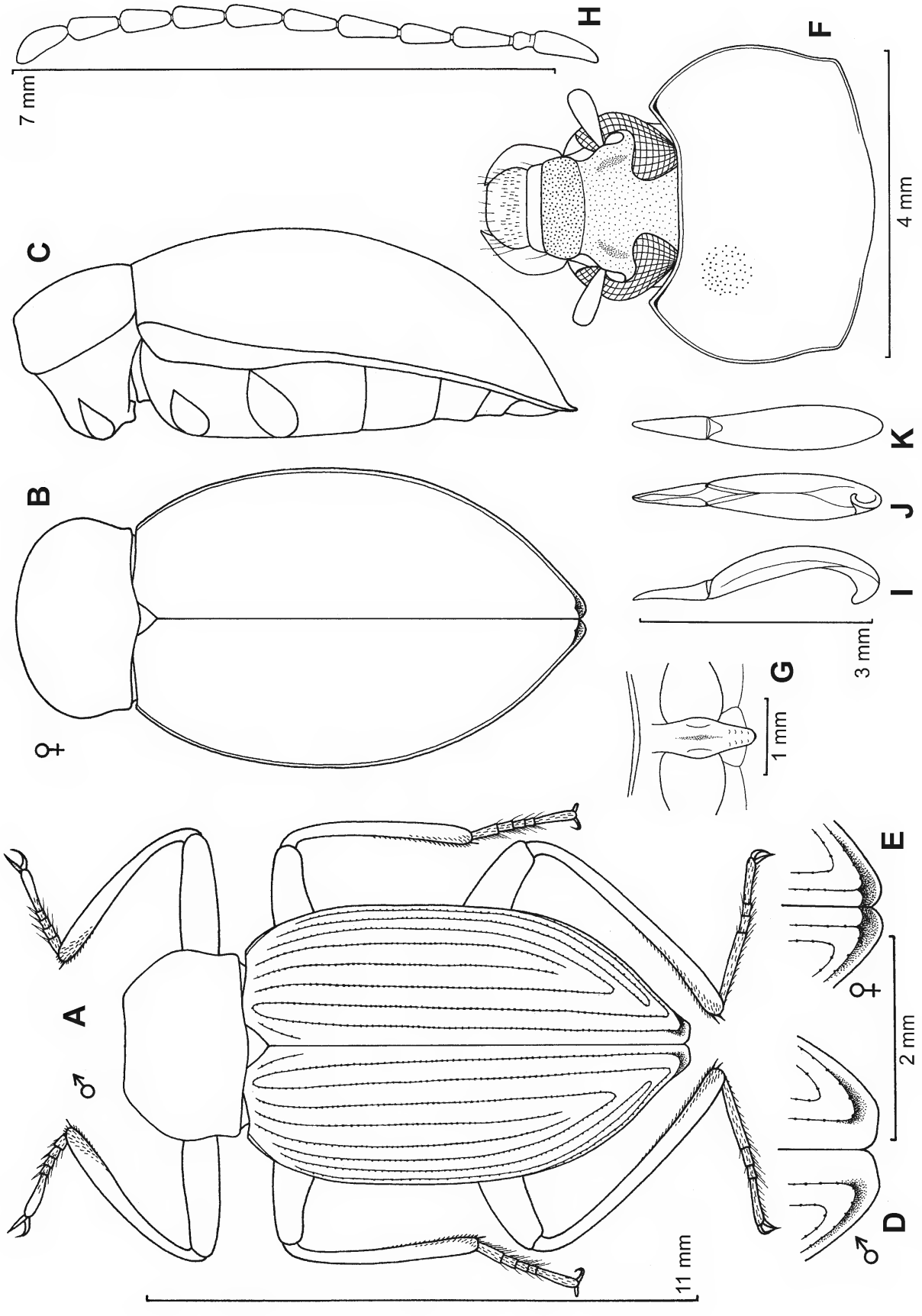


**Abb. 38.** *Amarygmus pertyi* Bremer, 2001. – **A** Habitus, ♂. **B** Habitus, ♀. **C** Körper lateral. **D** Enden der Flügeldecken, ♂. **E** Enden der Flügeldecken, ♀. **F** Kopf und Halsschild. **G** Prosternalapophyse. **H** Fühler. **I** Aedoeagus lateral. **J** Aedoeagus ventral. **K** Aedoeagus dorsal.

Länge deutlich exponiert und von oben sichtbar. Enden der Flügeldecken zur Naht hin eingezogen, bei den ♀♀ sind die Enden der Flügeldecken mehr verrundet, bei den ♂♂ mit mehr oder weniger gerader Begrenzung. Striae der Flügeldecken mit sehr kleinen und dicht stehenden Punkten; Interstitien leicht gewölbt. Fühler lang, zurückgelegt überlappen sie die Flügeldecken bis zur Mitte. Breite der Stirn etwas schmaler als die Länge des 3. Antennomers. Meist finden sich nur kleine Reste von Flügeln, seltener sind Flügel vorhanden. Metasternum etwas verkürzt. Protarsomeren 1–3 der ♂♂ nicht verbreitert. Oberseite kupferfarben, glänzend. Unterseite, Beine einschließlich Tarsen, und Fühler schwarz. Haare an den Tarsen gelbbraun.

Steht dem *A. metallicus* (Perty, 1831), der in demselben Gebiet vorkommt, sehr nahe. *A. metallicus* ist etwas stärker gewölbt und etwas breiter; die Apices der Flügeldecken sind bei beiden Geschlechtern einzeln verrundet (bei *A. pertyi* bei den ♂♂ mit mehr geradem Abschluß), die Interstitien der Flügeldecken sind meist gering punktiert (bei *A. pertyi* deutlich, eng, wenn auch fein punktiert), der Halsschild ist kaudad der Mitte wesentlich stärker verengt als meist bei *A. metallicus*, beim Prosternum ist der Abstand zwischen Vorderrand des Prosternum und Vorderrand der Procoxae deutlich größer, das Metasternum ist länger und die Spitze des Aedoeagus ist etwas dorsad gebogen (bei *A. pertyi* ventrad).

### Ergänzende Beschreibung

M a ß e : Länge 9,24–11,8 mm. Breite 4,91–5,82 mm. – Relationen: Länge/Breite der Flügeldecken 1,43–1,54. Die Längen der Metatarsomeren 1–4 sind 36:12:10:28.

## *Amarygmus philippinensis* Gebien, 1944 (Abb. 39A–H)

*Amarygmus filicornis* Gebien, 1921: Gebien (1921: 491–493) [nec *Amarygmus filicornis* (Gravely, 1915), nec *Amarygmus filicornis* Gebien, 1920].
*Amarygmus philippinensis* Gebien, 1944: Gebien (1944: 504) [nom. n.].

### Material

Luzon, Laguna, Los Baños; Luzon, Mt. Maquiling; Palawan, Iwahig (Schultze) (8 Syntypen NHMBF, 1 Syntypus MNHP, 2 Syntypen ZSM). – Mindoro occid., Amnay River Valley, 25 km SE of Santa Cruz, 180 m, 12°57'N 120°56'E, 17.IV.2000, L. Dembický leg. (1 SMNS, 1 ZSMB). – Mindoro, Staudinger (1 ♀ MNHP). – Mt. Makiling, Luzon, Baker, *Amarygmus filicornis* Geb. [Gebiens Handschrift], B.M. 1963-600 (1 NHM). – Mt. Makiling, Luzon, Baker (1 ♂ MNHP). – Philippinen, Luzon, Montalban, leg. Böttcher (1 NMHUB). – Luzon, Montalban (2 MNHP). – Palawan Is., Bindoyan, 19.VI.1979, K. Wada (8 CA, 3 ZSMB). – Palawan, Puerto Princesa, 10.I.1980, R. De Keyzer (1 SSB). – S Palawan (1 MNHP). – Iwahig penal colony, I. Palawan, Philippines, leg. Kaoru Wada (1 CM).

### Diagnose

Mittelgroß, oval. Flügeldecken stark gewölbt, mit der größten Höhe und Breite etwa am Ende des ersten Drittels. Mittellange, wenig differenzierte Fühler, deren Antennomeren 6–10 nur gering apikad verbreitert sind (also filiform). Flügeldecken mit Punktreihen sehr eng stehender, mittelgroßer Punkte; Interstitien eben, eng und fein punktiert. Stirn mittelbreit, etwas breiter als die Länge des 3. Antennomers (wie 12:10). Tarsen kurz, Protarsomeren 1–3 bei den ♂♂ nicht verbreitert. Analsternit der ♂♂ ohne sexualdimorphe Besonderheiten. Oberseite dunkel metallisch, mit leicht herabgesetztem Glanz (fast anthrazitfarben), Unterseite schwarz. Beine (einschließlich Tarsen) und Fühler schwarz.

Gehört zu einer Gruppe von Arten mit ähnlich geformten Fühlern, ähnlicher Gestalt und Größe, zu der außerdem *A. langeri* n. sp., *A. rugipectus* n. sp. und *A. vulcanus* n. sp. zu zählen sind. *A. langeri* und *A. philippinensis* haben Punktreihen auf den Flügeldecken, während *A. rugipectus* und *A. vulcanus* Striae aufweisen. Im Gegensatz zu *A. philippinensis* ist der Halsschild bei *A. langeri* blau, auf den Flügeldecken wechselt die Farbe je nach Winkel des Lichteinfalls von purpurfarben bis schmutzig grün. Der Vorderrand des Halsschildes ist bei *A. langeri* stärker ausgeschnitten als bei *A. philippinensis*, so dass die Vorderecken des Halsschildes deutlicher spitz vorstehen.

Die ausführliche Originalbeschreibung von Gebien habe ich in einer vorausgehenden Publikation zitiert (Bremer 2001e: 273). Zu korrigieren wäre die Angabe zur größten Breite der Flügeldecken, die nicht hinter der Mitte der Flügeldecken zu finden ist, sondern ebenso wie die größte Höhe am Ende des ersten Drittels der Flügeldecken.

### Ergänzende Beschreibung

M a ß e : Länge 7,21–8,12 mm. Breite 4,26–4,98 mm. – Relationen: Länge/Breite der Flügeldecken 1,34–1,43. Die Längen der Metatarsomeren 1–4 sind 41:12:8:31.

## *Amarygmus planipennis* (Kulzer, 1951) (Abb. 40A–H)

*Platolenes planipennis* Kulzer, 1951: Kulzer (1951: 557–558).
*Amarygmus planipennis* (Kulzer, 1951): Bremer (2001a: 57).

### Material

Island Sibuyan, Baker (Holotypus ♂ NHMBF; verölt und damit nicht mit dem für diese Art charakteristischen Farbspiel). – Gleiche Funddaten wie Holotypus (Paratypus MNHP). – Marinduque, Boac, Îles Philippines, XI.1972, R. Ludewig leg. (1 ♂ MNHP). – Mindanao, 30 km NW of Maramag, Bagongsilang, 1700 m, 13.–17.V.1996, Bolm leg. (1 ♂ SMNS, 1 ♂ ZSMB). – Mindanao, 30 km W of Maramag, 1600 m, 28.–30.XII.1990, Bolm leg. (1 ♀ NHMB). – Mindanao, Mt. Apo, Ilomavis, 1400 m, 18.–19.V.1996, Bolm leg. (1 ♀ SMNS). – Mt. Apo, S Mindanao,

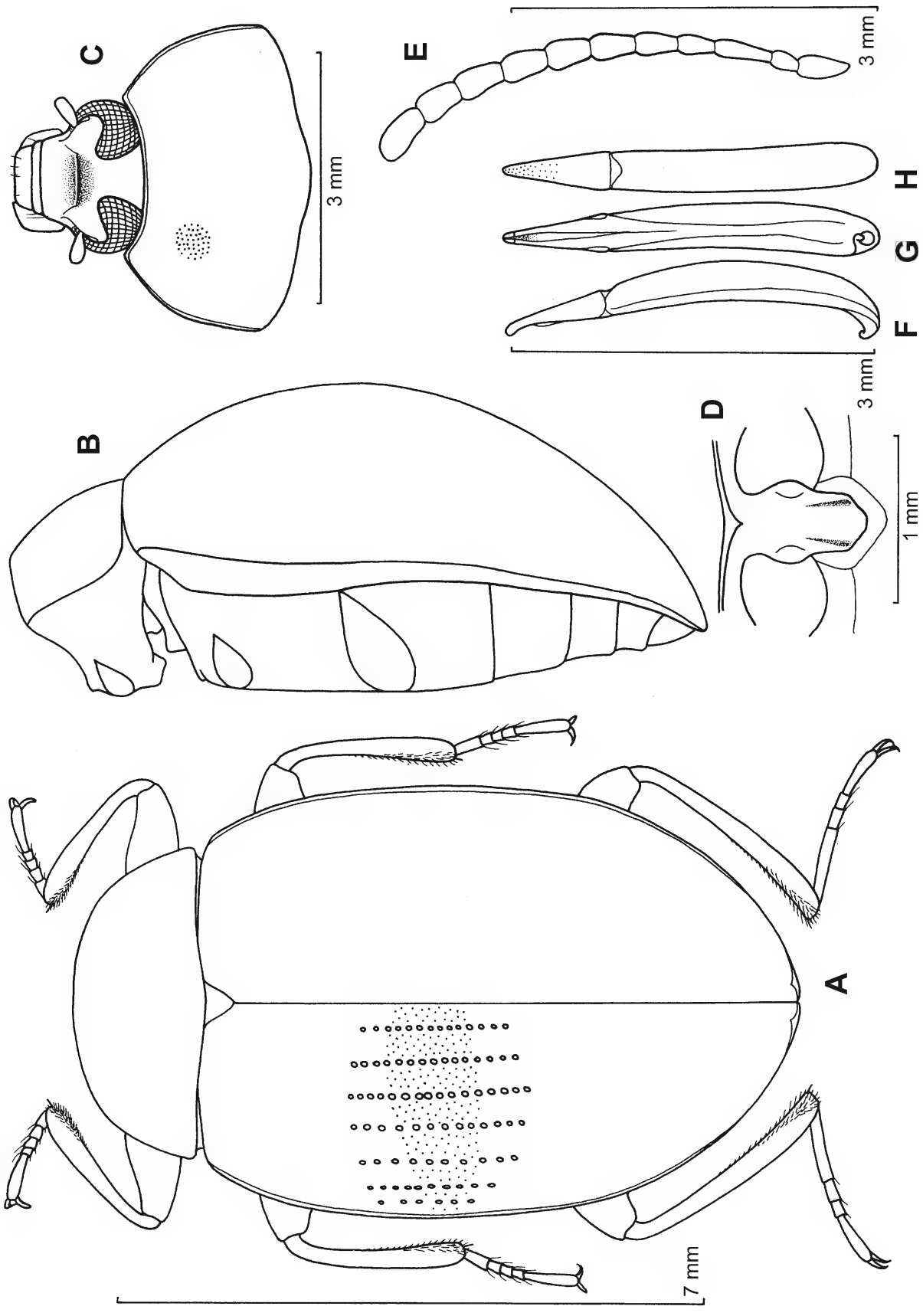


**Abb. 39.** *Amarygmus philippinensis* Gebien, 1944. – **A** Habitus. **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Fühler. **F** Aedoeagus lateral. **G** Aedoeagus ventral. **H** Aedoeagus dorsal.

Philippine[s] (6 CA, 1 ZSMB). – Philippines, Mindanao, Mt. Apo, Upper Varolin, alt. 1300 m, Davao del Sul, 29.–30. XI.1969 (1 CA). – Mindanao, Mt. Apo (3 ♂♂ NHMG). – Mindanao, Mt. Apo, 12.–18.V.1978, T. Mizunuma leg. (1 ♀ CM). – Mt. Apo, S Mindanao, Philippines, X.1985 (1 ♂ CM). – Mindanao, Misamis occ., Don Victoriano, 1700 m, 1.–3.V.1996, Bolm leg. (1 ♂ SMNS). – Mindanao, North Sambuang, Mt. Malindang, III.1995, leg. Mohagan (2 SSB, 1 ZSMB). – Philippines, Baracatan, 1500 m, Mindanao, 27.–29.VI.1977, M. Sato leg. (1 ♂ CM, 1 ♂ ZSMB). – Philippines, Luzon, Quezon N.P. (Lucena), 250 m, 8.–10.I.1991, Bolm leg. (1 ♂, 1 ♀ NHMB).

### Diagnose

Große, flache Art. Flügeldecken länglich oval, nur gering gewölbt, Seitenrandkante von oben breit sichtbar, größte Höhe und Breite der Flügeldecken am Ende des vorderen Drittels; Punktreihen mittelgroßer Punkte auf der Scheibe so eng gesetzt, dass sie sich meist berühren; Interstitien eben oder nur andeutungsweise gewölbt, Punktierung gut sichtbar aber nicht sehr dicht, fein. Halsschild mit feinen Punkten, hinten sehr flach, in der Mitte und vorne deutlich gewölbt. Stirn schmal. Prosternalapophyse schmal, lang. Fühler lang, dünn, bei den ♂♂ überlappen sie zurückgelegt etwas die Mitte der Flügeldecken, bei den ♀♀ erreichen sie die Mitte. Halsschild purpurn, Flügeldecken grünlich; bei einigen Exemplaren auch Halsschild grünlich und Flügeldecken purpurn, mit andersfarbigen Reflexionen oder nahezu braun und nur gering farbigem Schimmer. ♂♂ mit mittellangen, zarten, abstehenden (wenn angeklebt oder nass meist anliegenden) Haaren in der basalen Hälfte der Hinterseiten der Meso- und Metafemora, langen, zarten, nicht bedeckenden und halb abstehenden Haaren auf der Scheibe im hinteren Teil des Metasternums, sowie mäßig stark verbreiterten Protarsomeren 1–3.

*A. planipennis* gehört in die Artengruppe um *A. spectabilis* (Gebien, 1921), der gleich groß oder größer als *A. planipennis* aber einfarbig ist. Bezüglich der Färbung der Oberseite erinnert *A. planipennis* an *A. antiquus* n. sp. Die letztere Art besitzt aber im Gegensatz zu *A. planipennis* auf den Flügeldecken Punktreihen mit großen, deutlich voneinander getrennten Punkten.

*A. planipennis* nahe steht außerdem der einfarbige *A. negrosensis* n. sp. von der Insel Negros. *A. negrosensis* ist deutlich kleiner als *A. planipennis*, besitzt aber eine ebenso schmale Stirn. Die Protarsomeren der ♂♂ von *A. negrosensis* sind noch etwas schmaler als bei *A. planipennis*, in Relation zum vierten Metatarsomer ist bei *A. negrosensis* das erste Metatarsomer bedeutend länger, der Halsschild ist geringer gewölbt und die Interstitien der Flügeldecken sind dichter punktiert.

Ähnlich ist außerdem *A. plateni* Pic, 1951, der aber eine breitere Stirn aufweist.

### Ergänzende Beschreibung

Maße: Länge 11,4–14,1 mm. Breite 6,3–7,0 mm. – Relationen: Länge/Breite der Flügeldecken 1,54–1,62. Die Längen der Metatarsomeren 1–4 sind 39:16:7:33.

## *Amarygmus plateni* Pic, 1951

*Amarygmus plateni* Pic, 1951: Pic (1951: 15).

### Material

Davao, Mindanao, Dr. Platen, type, *Amarygmus Plateni* n. sp. (Holotypus MNHP). – Von dieser Art kenne ich nur den Holotypus.

### Anmerkung

Ich habe den Holotypus im MNHP gesehen. Eine genaue Untersuchung konnte ich bisher nicht vornehmen. Das Exemplar ist gelblichbraun, entweder extrem unreif oder – wahrscheinlicher, da auch andere farbige Arten in der Picschen Sammlung so vorliegen – durch chemische Behandlung entfärbt (Reinigung mit Wasserstoffperoxid?). Sehr ähnlich in Körpergröße und Körperform ist *A. planipennis* (Kulzer, 1951), der ebenfalls auf Mindanao vorkommt, aber *A. plateni* besitzt eine deutlich breitere Stirn als *A. planipennis*, so dass dieses Taxon eine separate Art darstellt. Weitere Exemplare von Mindanao, mit der Gestalt von *A. planipennis* aber breiterer Stirn, sind mir bisher nicht begegnet. Eine breitere Stirn als *A. planipennis* besitzt auch der auf Luzon vorkommende *A. abiectus* n. sp.; Annerkungen zu einer möglichen Synonymie siehe dort.

## *Amarygmus postdepressus* Pic, 1938

*Amarygmus postdepressus* Pic, 1938: Pic (1938: 10).

Nachbeschreibung und Abbildungen siehe Bremer (2004a: 29–31, 69–70).

### Material

Philippines, Mindanao, Zamboanga, Baker (1 ♂, 1 ♀ NHM). – Erstnachweis für die Philippinen.

### Diagnose

Breit oval, mit größter Breite und Höhe am Ende des ersten Drittels der Flügeldecken. Flügeldecken in den hinteren Abschnitten ziemlich flach, mit leicht eingedrückten Striae mit kleinen, meist etwas länglichen, ziemlich dicht stehenden Punkten. Interstitien mit winzigen, weitläufig stehenden Punkten; Wölbungen unterschiedlich deutlich ausgeprägt (bei manchen Tieren fehlen diese auf der Scheibe fast ganz, bei anderen sind sie deutlich gewölbt; seitlich findet sich immer eine deutliche Wölbung). Stirn ziemlich schmal, nur wenig breiter als die Länge des 2. Antennomers, bei den ♂♂ etwas schmaler als bei den ♀♀. Fühler mittellang, bei den ♂♂ etwas länger als bei

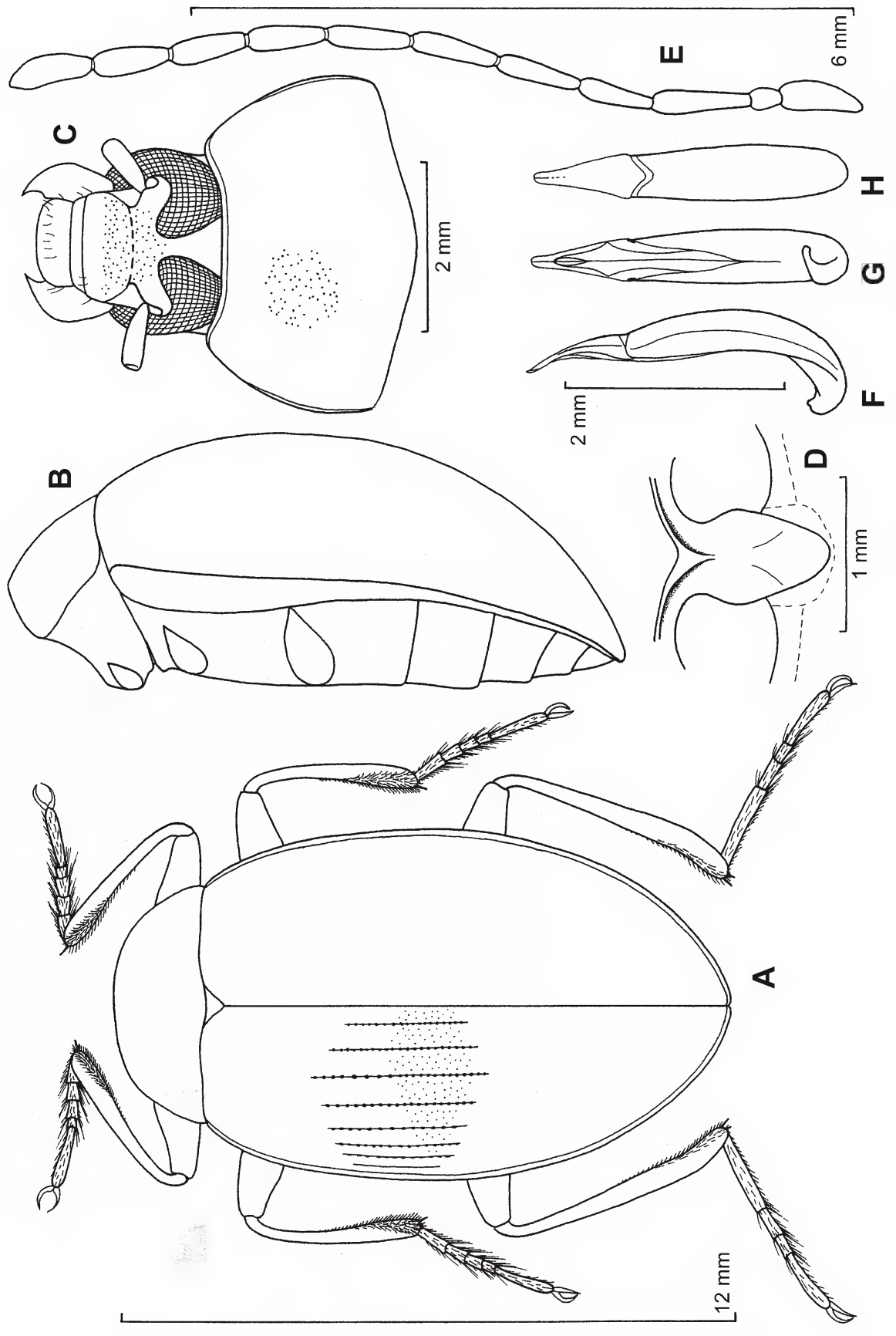


**Abb. 40.** *Amarygmus planipennis* (Kulzer, 1951). – **A** Habitus, ♂. **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Fühler. **F** Aedoeagus lateral. **G** Aedoeagus ventral. **H** Aedoeagus dorsal.

den ♀♀. Stirnnaht median tief, seitlich nur angedeutet eingeschnitten. Protarsomeren 1–3 bei den ♂♂ leicht verbreitert; seitlich ragen bei den ♂♂ von der Sohlenfläche der Protarsomeren 1–4 nicht sehr lange Haare hervor. Metatibiae bei den ♂♂ etwas länger als bei den ♀♀, apikad etwas verdickt, bei den ♂♂ im Gegensatz zu den ♀♀ in den apikalen drei Fünftel mit sehr kleinen Tuberkeln, von denen feine, abstehende, ziemlich kurze Haare entspringen. Charakteristischerweise finden sich bei den ♂♂ lange, dicht stehende Haare an den Vorderseiten der Profemora, an den Hinterseiten der Mesofemora sowie auf der Prosternalapophyse, auf dem Hinterteil des Mesosternums und auf dem Metasternum. Die Fühler überlappen zurückgelegt etwa das erste Drittel der Flügeldecken. Oberseite kupfern, sehr stark glänzend, mit interindividuell unterschiedlich stark ausgeprägten, queren Reflexionen in den Regenbogenfarben, besonders auf den Flügeldecken. Tibiae und Tarsen schwarzbraun.

Gehört zu einer Gruppe einander sehr ähnlicher Arten (aus der orientalischen Region) mit demselben Sexualdimorphismus und derselben Gestalt (siehe Bestimmungstabelle von Bremer 2004b: 127).

### Ergänzende Beschreibung

Maße: Länge 6,45–7,80 mm. Breite 4,06–5,25 mm. – Relationen: Länge/Breite der Flügeldecken 1,26–1,33. Die Längen der Metatarsomeren 1–4 sind 19:7:5:15.

### Verbreitung

*A. postdepressus* besitzt eine sehr weite Verbreitung von Sumatra, über die Malayische Halbinsel und Borneo und ist an den Fundorten meist häufig anzutreffen. Ich nehme an, dass es sich bei dem Fund an der Südspitze von Mindanao entweder um eine Verschleppung von Borneo handelt, oder dass sich das Verbreitungsgebiet dieser Art auch noch auf den Süden der Philippinen erstreckt. Neuere Nachweise für diese Art aus den Philippinen kenne ich nicht.

## *Amarygmus pulcher* (Kulzer, 1951)
(Abb. 41A–H)

*Platolenes pulcher* Kulzer, 1951: Kulzer (1951: 548).
*Amarygmus pulcher* (Kulzer, 1951): Bremer (2001a: 57).

### Material

Mt. Banahao, Luzon; [gedruckt] Philippinen (Böttcher); [gedruckt, oranges Papier] Holotype; [weißes Papier, handschriftlich] *Platolenes pulcher* Klzr. det H. Kulzer 1951 (Holotypus ♂ NHMBF).

Anmerkung: Der von Kulzer ausgezeichnete und publizierte „Allotypus“ gehört einer anderen Art an; er wird in dieser Arbeit als *A. vicarius* n. sp. beschrieben.

### Diagnose

Große, schmale, länglich ovale, glänzende Art mit einer farbigen Oberseite auf Halsschild und Flügeldecken (Halsschild je nach Einfallswinkel des Lichts in den Spektralfarben reflektierend, auf den Flügeldecken mit grünen und purpurfarbenen Längsstreifen). Unterseite schwarz, Metasternum glänzend, Sternite matt. Punktreihen dicht stehender, mittelgroßer Punkte auf den Flügeldecken. Protarsomeren 1–3 beim ♂ stark verbreitert. Stirn relativ breit (Breite entspricht etwa der Länge des 3. Antennomers). Flügeldecken mit Punktreihen eng stehender, mittelgroßer Punkte, die nicht miteinander durch Striche verbunden sind; die Reihen sind nicht eingedrückt, etwa 48 Punkte in der 4. Reihe. Interstitien auf der Scheibe flach, seitlich nur gering gewölbt. Beim ♂ an den Hinterseiten der Mesofemora lange, dicht stehende, blonde Haare; Metasternum und 1. Sternit kahl; an der Innenseite der Protibiae apikal ein kurzes Feld dicht stehender Haare; an der Innenseite der Mesotibiae ein Haarfeld langer, dicht- und abstehender Haare, das das apikale Viertel einnimmt. Intersegmentalmembran beim ♂ zwischen den Sterniten 3 und 4 stark verbreitert, Sternit 3 stark verkürzt, Membran zwischen Sternit 4 und 5 nicht verbreitert. Metasternum vorne mit mittelgroßen, weitläufig stehenden Punkten, dahinter wesentlich kleinere Punkte. Sternite 1–3 mit dicht stehenden, kleinen Punkten. Analsternit beim ♂ ohne strukturelle Besonderheiten. Fühler lang, dünn, zurückgelegt etwa die Mitte der Flügeldecken erreichend.

*A. pulcher* besitzt dieselbe Größe und Färbung von Halsschild und Flügeldecken wie *A. cuprarius*, der auf den Philippinen ziemlich häufig vorkommt. Im Gegensatz zu *A. pulcher* haben Exemplare von *A. cuprarius* eine wesentlich schmalere Stirn, kürzere Fühler, breitere und kürzere Flügeldecken, die Punkte der Punktreihen der Flügeldecken sind kleiner und durch Striche miteinander verbunden, die Protarsomeren der ♂♂ sind nicht verbreitert und die weiteren sekundären Geschlechtsmerkmale von *A. pulcher* fehlen.

*A. pulcher* wurde von Kulzer (1951) mit *A. vicarius* n. sp. verwechselt, zumindest hat Kulzer den Holotypus von *A. vicarius* als weiblichen Allotypus von *A. pulcher* ausgezeichnet. Die Gemeinsamkeiten und Unterschiede beider Arten sind bei *A. vicarius* angegeben.

Eine gewisse Ähnlichkeit besteht mit *A. coloratus* (Kulzer, 1951), der auch farbige Längsstreifen auf den Flügeldecken und ähnliche sekundäre Geschlechtsmerkmale aufweist, aber die Punkte der Punktreihen der Flügeldecken stehen bei *A. coloratus* deutlich weiter voneinander entfernt als bei *A. pulcher* und die Fühler sind kürzer.

### Ergänzende Beschreibung

Maße: Länge 12,4 mm. Breite 6,1 mm. – Relationen:

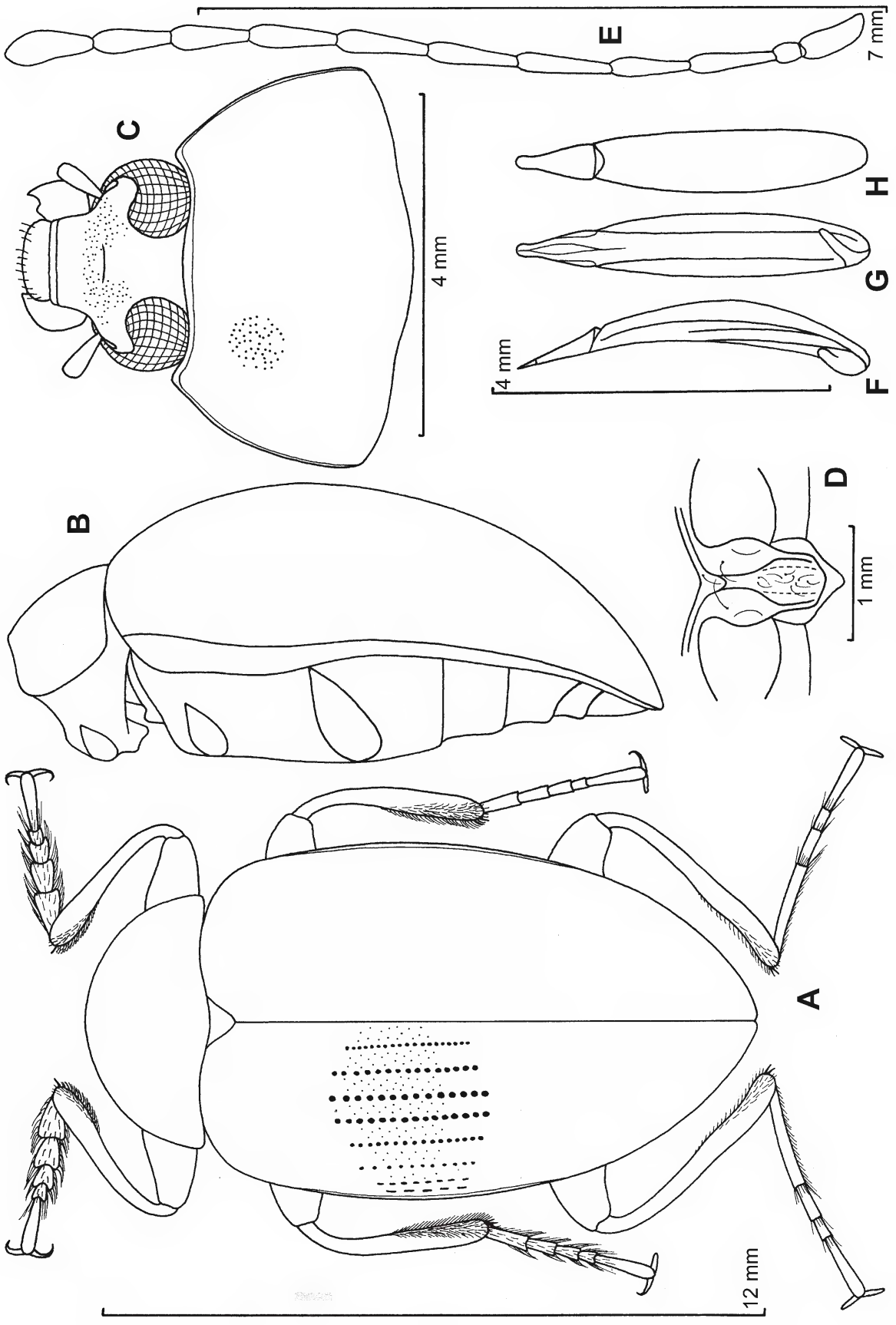


**Abb. 41.** *Amarygmus pulcher* (Kulzer, 1951). – **A** Habitus, ♂. **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Fühler. **F** Aedoeagus lateral. **G** Aedoeagus ventral. **H** Aedoeagus dorsal.

Länge/Breite der Flügeldecken 1,58. Die Längen der Metatarsomeren 1–4 sind 41:18:9:29.

### *Amarygmus schawalleri* Bremer, 2002 (Abb. 42A–D)

*Amarygmus schawalleri* Bremer, 2002: Bremer (2002b: 37).

#### Material

Philippines, Leyte, Visca N Baybay, sec. forest, 100–200 m, 4.III.1991, leg. Schawaller et al. (Holotypus ♂ SMNS).

#### Diagnose

Sehr kleine Art, die dadurch auffällt, dass die vorderen Bereiche der Flügeldecken schwarz, der Rest der Oberseite rotbraun gefärbt ist; insgesamt glänzt die Oberseite sehr stark. – Ich kenne keine andere Art, die mit *A. schawalleri* verwechselt werden könnte.

#### Ergänzende Beschreibung

Maße: Länge 2,87 mm. Breite 1,43 mm. – Relationen: Länge/Breite der Flügeldecken 1,31. Die Längen der Metatarsomeren 1–4 sind 21:8:3½:10.

### *Amarygmus spectabilis* (Gebien, 1921) (Abb. 43A–J)

*Platolenes spectabilis* Gebien, 1921: Gebien (1921: 489–490).
*Amarygmus spectabilis* (Gebien, 1921): Bremer (2001a: 57).

#### Material

Philipp. I., Mt. Banahao (C. Baker), Type No. 1077, *Platolenes spectabilis* Geb. (Lectotypus ♂, hiermit designiert; Paralectotypus ♀, beide NHMBF). – Philippines, S Luzon, Quezon N.P. (Lucena), 250 m, 8.–10.I.1991, Bolm leg. (1 NHMB, 1 ZSMB). – Philippines, N Luzon, Ilocos Norte Pr., Patapat Mts., N of Adams, 18°30'N 120°55'E, 3.IV.2000, L. Dembický leg. (1 ♀ SMNS).

Anmerkungen: Die sehr ausführliche Originalbeschreibung von Gebien ist zitiert in Bremer (2001e: 299). – Da sich männliche und weibliche Exemplare durch Sexualdimorphismus unterscheiden, habe ich den männlichen Syntypus der beiden im NHMBF befindlichen Syntypen als Lectotypus festgelegt.

#### Diagnose

Große, länglich ovale, einfarbige Art (dunkelgrün bis dunkelbraun). ♂♂ mit leicht verbreiterten Protarsi. Stirn bei beiden Geschlechtern sehr schmal (Breite entspricht etwa dem Durchmesser von 1–2 Ocellen der Augen). Flügeldecken mit von oben in der ganzen Länge sehr gut sichtbaren Seitenrandkanten, mit Reihen sehr dicht stehender, kleiner Punkte, die in leicht eingedrückten Striae liegen. Interstitien auf der Scheibe angedeutet, lateral deutlich gewölbt, mit feinen, ziemlich dicht stehenden Punkten. Fühler lang, zurückgelegt etwa die Mitte der Flügeldecken erreichend. Rückseiten der Meso- und Metafemora der ♂♂ mit langen, zarten Haaren; lange, abstehende Haare finden sich bei den ♂♂ auch neben der Mittellinie auf dem Metasternum, kürzere, anliegende Haare auf der Scheibe des 1. Sternits. Ein Exemplar hat die Basis der Femora rötlich gefärbt.

*A. spectabilis* steht *A. planipennis* (Kulzer, 1951) und *A. plateni* Pic, 1951 nahe. Beide Arten haben aber eine leicht (*A. planipennis*) oder deutlich (*A. plateni*) breitere Stirn als *A. spectabilis*. Außerdem hat *A. planipennis* im Gegensatz zu *A. spectabilis* einen violett gefärbten Halsschild. Die langen Haare an den Rückseiten der Meso- und Metafemora finden sich auch bei den ♂♂ von *A. planipennis*. Bezüglich der Unterschiede zu *A. negrosensis* n. sp., *A. antiquus* n. sp. und *A. jaegeri* n. sp., die ebenfalls zu dieser Gruppe gehören, siehe bei diesen Arten bzw. in der Bestimmungstabelle.

#### Ergänzende Beschreibung

Maße: Länge 11,9–12,3 mm. – Relationen: Länge/Breite der Flügeldecken 1,49–1,59; Länge Flügeldecken/Länge Halsschild 3,82–4,06; maximale Breite Flügeldecken/maximale Breite Halsschild 1,38–1,43.

Beine: Lang. Femora zum zweiten Drittel hin nur gering keulenförmig verdickt. Protibiae annähernd gerade, an der Innenseite im apikalen Viertel bei den ♂♂ leicht verdickt und mit einem Feld nicht sehr langer, dicht stehender, blonder Haare. Mesotibiae ähnlich geformt und mit denselben sekundären Geschlechtsmerkmalen. Metatibiae außen mit einer angedeuteten Konkavität und apikal sehr leicht verrundet eingezogen, innen annähernd gerade. Pro- und Mesotarsomeren 1–3 der ♂♂ etwas verbreitert, auf der Sohlenfläche bürstenartig dicht behaart, wobei die seitlichen Haare laterad etwas vorstehen. Die Längen der Protarsomeren 1–5 bei einem ♀ sind 8:7:7:6:27, die der Mesotarsomeren 1–5 sind 12:9:7:6:29, die der Metatarsomeren 1–4 sind 32:14:9:28.

### *Amarygmus trichosternum* Gebien, 1944 (Abb. 44A–H)

*Amarygmus pilipectus* Gebien, 1921: Gebien (1921: 490–491) [nec *A. pilipectus* Gebien, 1920 aus Neu Guinea].
*Amarygmus trichosternum* Gebien, 1944: Gebien (1944: 504) [nom. n.].

#### Material

Philipp. I., Benguet, Baguio, C. Baker (2 ♂♂ Syntypen NHMBF). – Manila, Fetting (1 ♀ ZSM). – Luzon, Philippines, Laguna Prov., Mt. Maquiling, 17.–18.VI.1977, Y. Kurosawa (1 ♂ CM). – N Luzon, Zambales Pr., Zambales Mts., High Peak-W-side, 850 ± 500 m, 15°26–28'N 120°03–06'E, 18.III.2000, L. Dembický leg. (1 SMNS). – Philippinen (Boetticher), Leyte (1 ♀ ZSM). – Philippinen, Leyte, … [unleserlich], X.1915, S. Böttcher (1 ♂, 1 ♀ NMHUB). – Marinduque Prov., Île Boac,

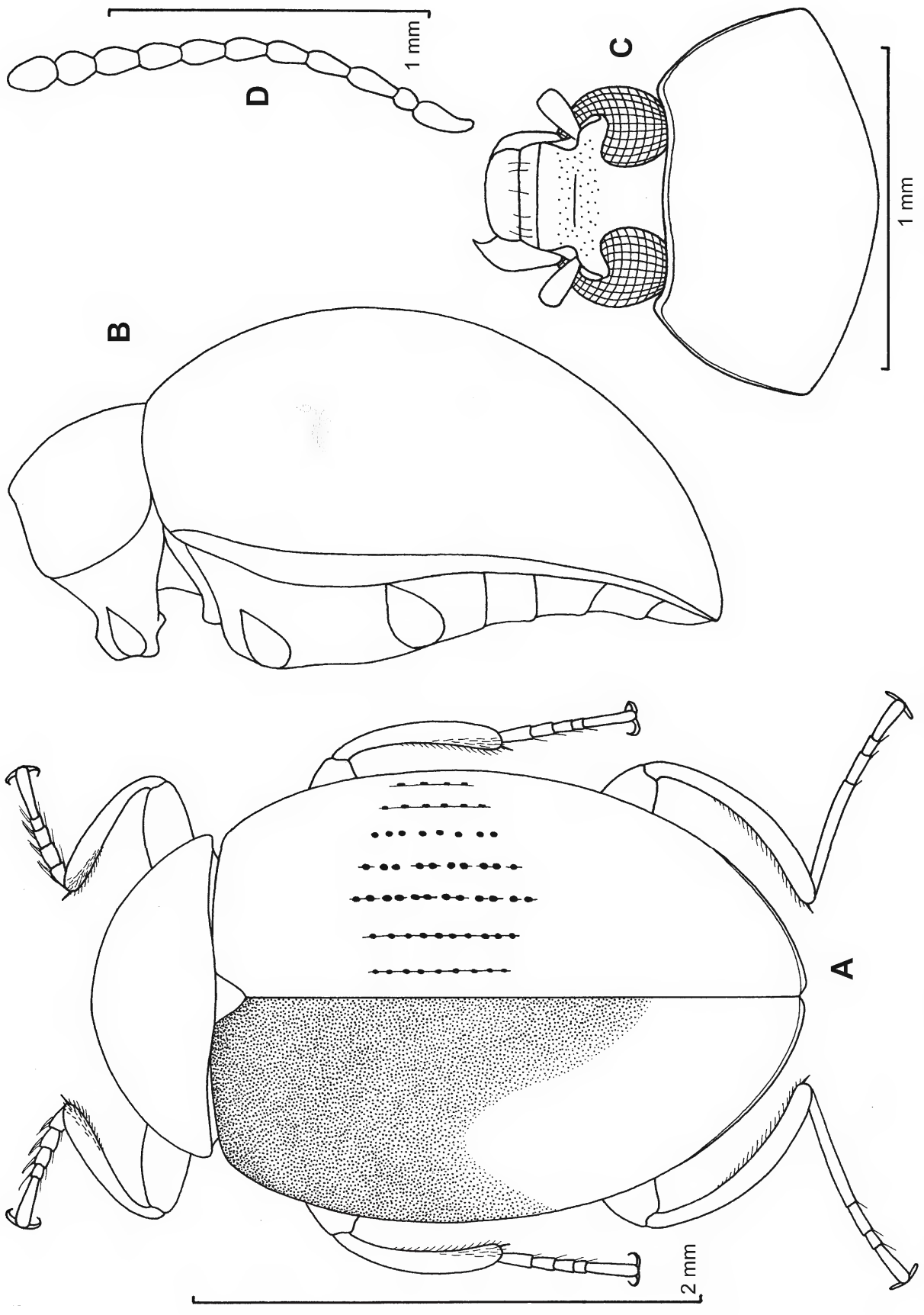


**Abb. 42.** *Amarygmus schawalleri* Bremer, 2002. – **A** Habitus, punktierter Bereich schwarz, Rest rotbraun. **B** Körper lateral. **C** Kopf und Halsschild. **D** Fühler.

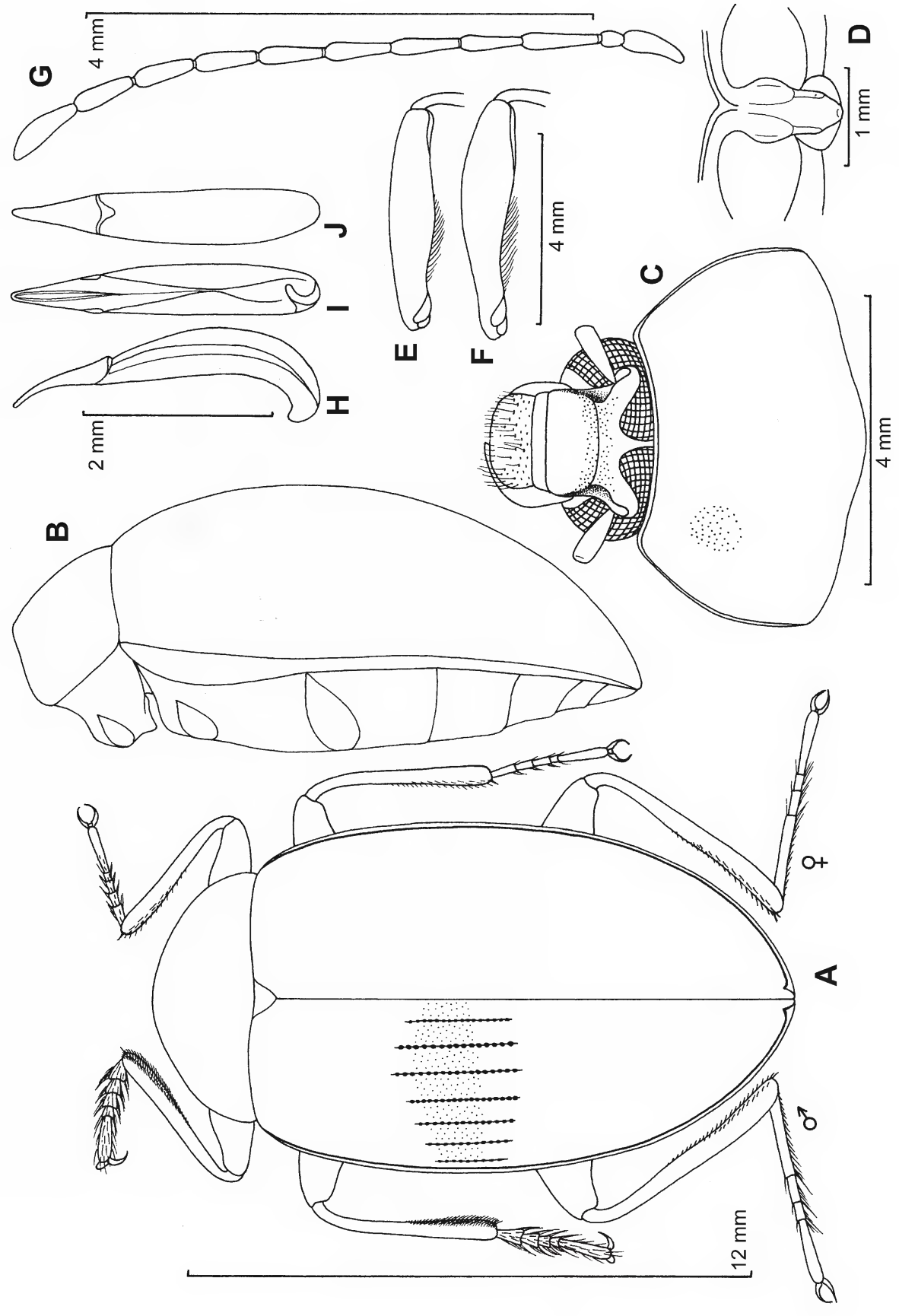


**Abb. 43.** *Amarygmus spectabilis* (Gebien, 1921). – **A** Habitus; linksseitig Beine ♂, rechtsseitig Beine ♀. **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Mesofemur, ♂. **F** Metafemur, ♂. **G** Fühler. **H** Aedoeagus lateral. **I** Aedoeagus ventral. **J** Aedoeagus dorsal.

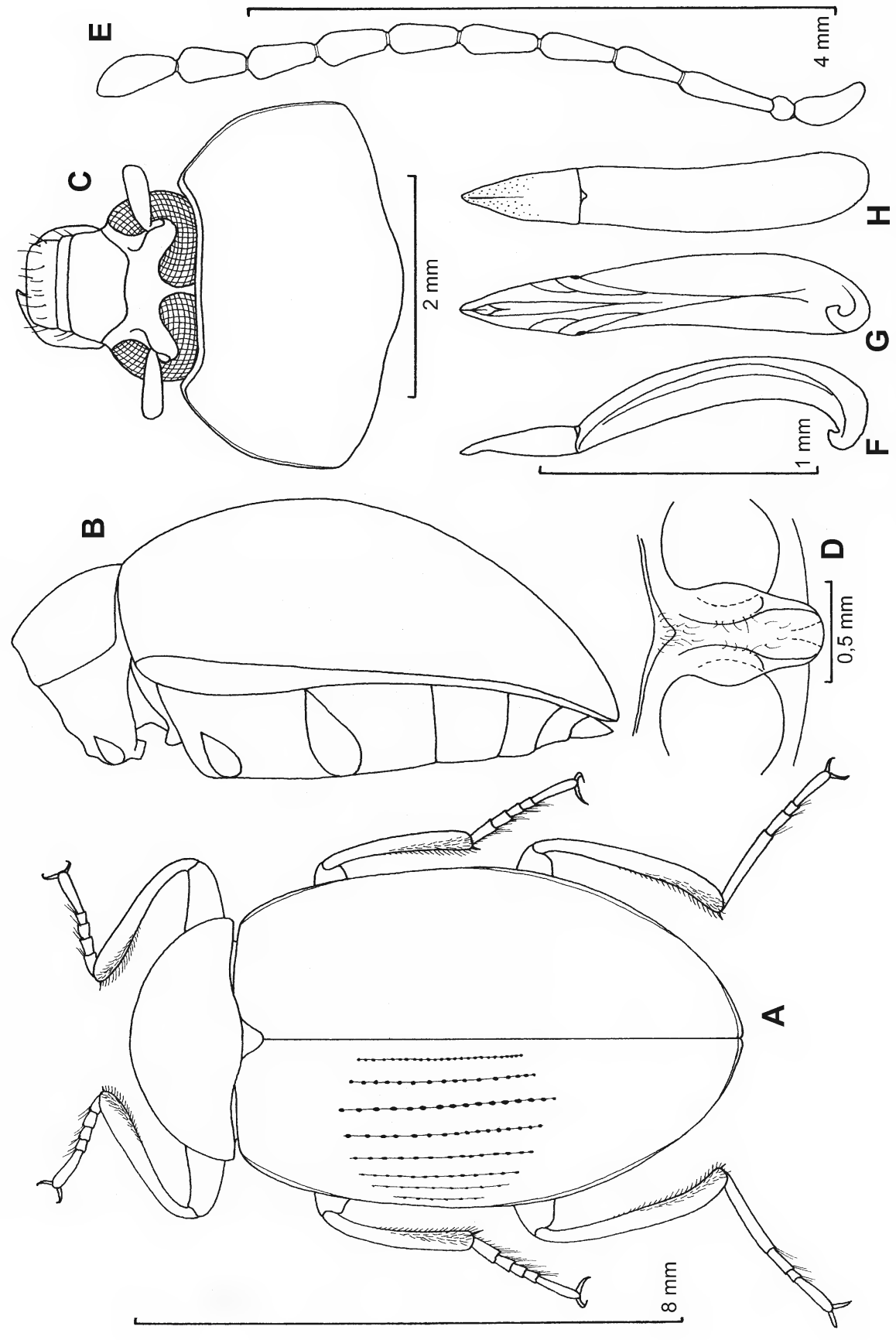


**Abb. 44.** *Amarygmus trichosternum* Gebien, 1944. – **A** Habitus, ♂. **B** Körper lateral. **C** Kopf und Halsschild, ♂. **D** Prosternalapophyse. **E** Fühler. **F** Aedoeagus lateral. **G** Aedoeagus ventral. **H** Aedoeagus dorsal.

XI.1972, R. LUDEWIG leg. (1 ♂ MNHP). – Leyte, Philipp., *Amarygmus pilipectus* Geb. [GEBIENS Handschrift]; *Amarygmus trichosternum* GEBIEN, det. H. KULZER 1963 (1 NHM). – Philippines, Leyte, Lake Danao, forest edge, 500 m, 19.II.1991 leg. SCHAWALLER et al. (2 SMNS, 1 ZSMB). – Surigao, Mindanao (1 ♂ ZSMB).

Diagnose

Relativ große, länglich ovale Art. Stirn sehr schmal (bei den ♀♀ etwas breiter als bei den ♂♂), etwa von der Breite zweier Ocellen der Augen. Fühler lang, dünn, zurückgelegt etwa die Mitte der Flügeldecken erreichend. Flügeldecken mit dicht stehenden, mittelgroßen Punkten, die durch zarte Striche miteinander verbunden sind (etwa 48 in der 4. Stria); Interstitien eben, nur seitlich etwas gewölbt, winzig (aber gut sichtbar) und nicht sehr dicht punktiert. Flügeldecken glänzend, mit nicht sehr ausgeprägten, queren, farbigen Reflexionen. Femora und Tibiae schwarzbraun, Tarsen etwas heller braun. Wangen klein und schmal, vorne vor der Stirnnaht endend, etwas gewölbt. Stirnnaht breit eingedrückt. Metasternum (aber nicht Sternite!) bei den ♂♂ mit dicht stehenden, feinen Punkten, die Ausgangspunkt für abstehende, zarte, mittellange Haare sind. Beine relativ kurz. Femora nicht sehr stark keulenartig verdickt. Protibiae basal leicht gekrümmt, dann annähernd gerade, bei den ♂♂ an der Innenseite apikal etwas verdickt. Mesotibiae annähernd gerade. Metatibiae in der basale Hälfte annähernd gerade, in der apikalen Hälfte sehr leicht nach innen gekrümmt. Protarsomeren 1–3 der ♂♂ leicht verbreitert.

Eine gewisse Ähnlichkeit besteht mit *A. planipennis* (Kulzer, 1951) und mit *A. negrosensis* n. sp. Beide Arten sind aber geringer quer gewölbt, so dass die Seitenrandkanten der Flügeldecken von oben sehr breit sichtbar sind (bei *A. trichosternum* nur schmal sichtbar).

Ergänzende Beschreibung

Maße: Länge 9,08–9,87 mm. – Relationen: Länge/Breite der Flügeldecken 1,40–1,46. Die Längen der Metatarsomeren 1–4 sind 33:10:6:18.

## 5 Beschreibung von *Luzonoplonyx grandis* n. gen., n. sp.

### *Luzonoplonyx* n. gen.

Genotypus: *Luzonoplonyx grandis* n. sp.

Etymologie

Der Name *Luzonoplonyx* ist zusammengesetzt aus *Luzon*, der Insel des Fundortes, und *plonyx*, Suffix vieler Amarygmini-Gattungen.

Gattungsdiagnose

Langgestreckt, gering gewölbt, mit weit vorstehenden Vorderecken des Halsschildes. Hinterrand des Halsschildes durchgehend fein gerandet. Mit nach vorne vorragenden Vorderecken der Seitenrandkanten der Flügeldecken. Seitenrandkanten der Flügeldecken bis auf den Apex auf die Unterseite des Körpers verlagert; eine Scutellarlinie fehlt. Die Flügeldecken lassen sich einzeln anheben. Flügel fehlen. Scutellum nahezu vollständig durch Halsschild verdeckt. Stirn sehr breit. Zwischen Vorderrand von Clypeus und Labrum findet sich eine breite, von oben sichtbare Membran. Auf der Rückseite der Metatibiae keine stachelartigen Borsten. Mandibeln apikal bifid.

Ähnelt der Gattung *Dalmanius* Bremer, 2001. Beide Genera sind flügellos, besitzen eine sehr breite Stirn, ein nahezu durch den Halsschild verdecktes Scutellum, und bei beiden Genera sind die Seitenrandkanten der Flügeldecken auf die Unterseite verlagert. Sie lassen sich wie folgt trennen:

**1** Halsschild gering gewölbt, die Seiten kaum herabgebogen. Hinterseiten der Metatibiae glatt, ohne stachelartige Borsten. Flügeldecken oben ziemlich flach, nicht miteinander verwachsen (lassen sich getrennt anheben), mit nach vorne ragenden Außenkanten, mit fein punktierten Striae, ohne Scutellarlinie. . . . . ***Luzonoplonyx* n. gen.**

– Halsschild quer sehr stark gewölbt, Seiten stark herabgebogen. Hinterseiten der Metatibiae dicht mit stachelartigen Borsten besetzt. Flügeldecken quer sehr stark gewölbt, miteinander verwachsen (lassen sich nicht getrennt anheben), ohne nach vorne ragende Außenkanten, mit Punktreihen, Scutellarlinie vorhanden. . . . . ***Dalmanius***

### *Luzonoplonyx grandis* n. sp.
(Abb. 45A–E)

Holotypus (♀): Luzon, Philippines, Bontoc Prov., Mt. Pangao, 31.V.1977, Y. KUROSAWA (CM).

Paratypus: Gleiche Funddaten wie Holotypus (1 ♀ CM).

Etymologie

Grandis (lat.) = groß.

Diagnose

Groß. Flügeldecken länglich oval. Seitenrandkanten der Flügeldecken von oben nur am Apex sichtbar. Auf den Flügeldecken Striae mit kleinen Punkten; an den Schultern sind die Seitenrandkanten etwas kraniad vorgezogen. Ziemlich langer, schmaler Halsschild, der auf der Oberseite nur gering gewölbt ist. Stirn auffallend breit. Fühlerglieder auch bei den apikalen Antennomeren im Querschnitt rund. Metasternum sehr stark verkürzt. Flügellos.

*Luzonoplonyx grandis* n. sp. ist am ehesten zu vergleichen mit dem wesentlich kleineren *Dalmanius peregrinus* Bremer, 2001, der einen quer sehr stark gewölbten Hals-

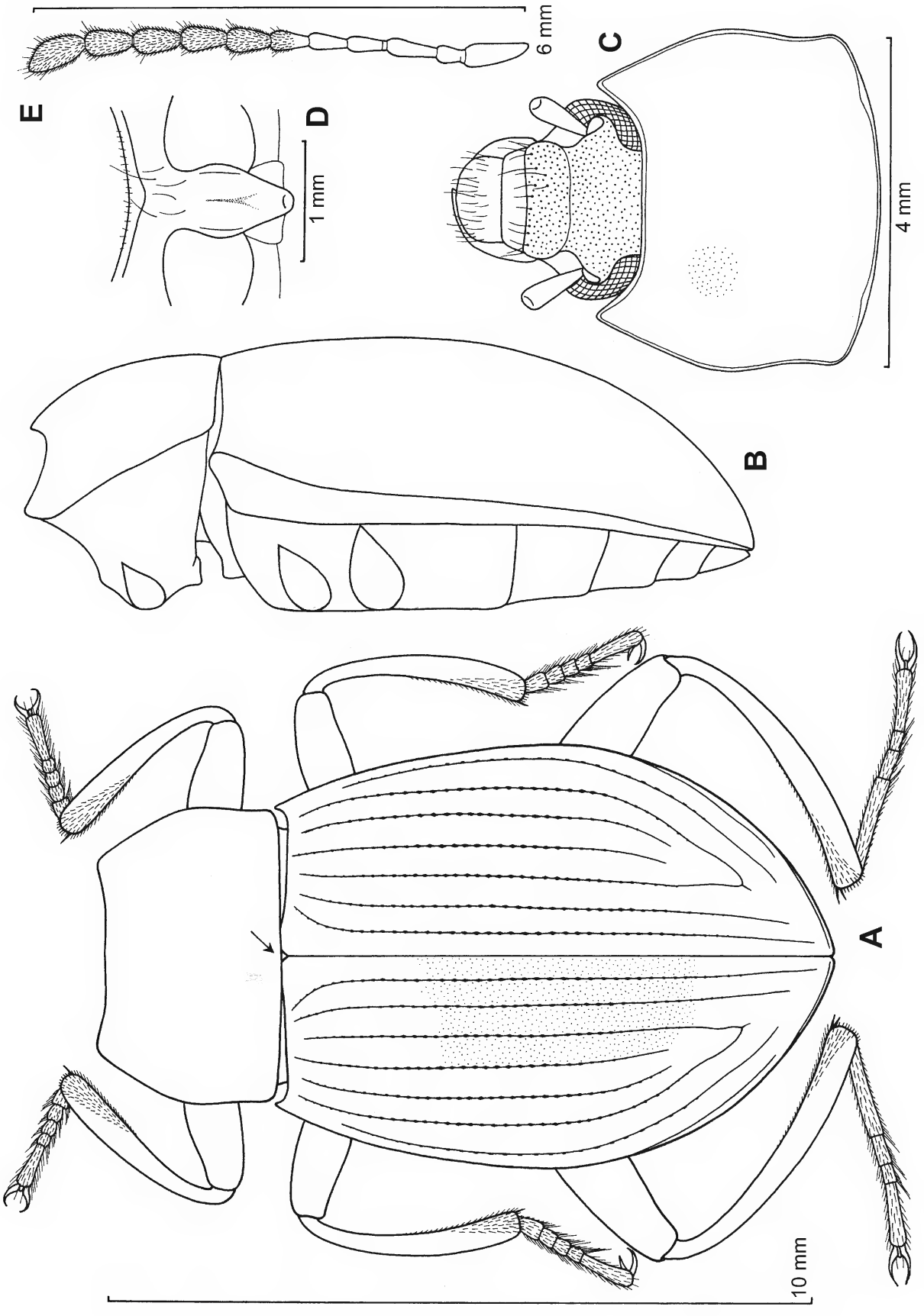


**Abb. 45.** *Luzonoplomyx grandis* n. sp. – **A** Habitus, ♀ (der Pfeil weist auf das sehr kleine Scutellum hin). **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Fühler.

schild besitzt, die Flügeldecken wesentlich stärker gewölbt hat und auf den Flügeldecken Punktreihen mit feinen Punkten aufweist.

Beschreibung

Maße: Länge 10,2 + 10,8 mm. Breite 5,5 + 5,6 mm. – Relationen: Breite/Länge des Halsschildes 1,39; Breite Hinterecken/Breite Vorderecken des Halsschildes 1,41. Länge/Breite der Flügeldecken 1,46; Länge Flügeldecken/Länge Halsschild 2,93; maximale Breite Flügeldecken/maximale Breite Halsschild 1,44.

Farbe: Oberseite schwarz, gering glänzend. Unterseite schwarzbraun bis schwarz, überwiegend matt. Femora schwarzbraun, apikal mit rotbrauner Kappe. Tibiae und Tarsen braun. Antennomeren 1–6 braun, 7–11 schwarz, matt.

Kopf: Herabgebogen. Stirn sehr breit, flach, mit kleinen, verwaschenen, ziemlich dicht stehenden Punkten. Eine Trennung der Wangen von der Stirn ist nicht auszumachen, da die medialen Teile der Wangen auf derselben Ebene wie die Stirn liegen und wie die Stirn punktiert sind; die äußeren Ränder der Wangen sind etwas aufgebogen; die Wangen sind kurz und enden vorne vor der Höhe, die der Mitte der Stirnnaht entspricht. Stirnnaht bogenförmig, angedeutet eingeschnitten. Clypeus nicht sehr weit vorgezogen, oben flach, erst seitlich etwas herabgebogen, Vorderrand gerade; mit kleinen, dicht stehenden Punkten. Zwischen Vorderrand des Clypeus und Labrum findet sich eine ungewöhnlich breite, gelbe Membran. Mentum umgekehrt trapezförmig, Vorderecken verrundet, mit breiten, ebenen Seitenrändern; median dazwischen deutlich gewölbt und glänzend. Mandibeln apikal bifid.

Halsschild: Ziemlich lang und für Amarygmini schmal. Quer und längs sehr leicht gewölbt. Größte Breite etwa in der Mitte, nach vorne und hinten etwa gleich stark eingezogen. Vorderecken stehen spitzwinklig weit nach vorne vor. Vorderrand stark ausgeschnitten. Hinterecken leicht stumpfwinklig. Seitenränder schmal gerandet. Vorderrand ebenfalls schmal gerandet, aber Randung median etwas abgeschwächt. Bei Aufsicht sind die Randungen der Seiten von oben schmal sichtbar. Bei Ansicht von der Seite sind die Vorderecken spitzwinklig, die Hinterecken stumpfwinklig. Oberseite mit so verwaschenen, winzigen Punkten, dass die Oberseite wie unpunktiert erscheint.

Scutellum: Dreieckig, fast vollständig durch den Halsschild verdeckt.

Flügeldecken: Länglich oval, mit der breitesten Stelle hinter der Mitte, längs leicht gewölbt. Seiten zu den Schultern hin eingezogen, aber die Seitenrandkante ist als schmale Kante deutlich kraniad vorgezogen. Enden der Flügeldecken angedeutet als Mukro vorstehend. Seitenrandkanten bis auf den Apex auf die Unterseite verlagert und von oben nicht sichtbar. Auf der Oberseite sehr leicht eingeschnittene Striae mit kleinen, undeutlichen Punkten. Interstitien angedeutet gewölbt, mit winzigen, weitläufig stehenden, undeutlichen Pünktchen.

Prosternum: Vorderrand durchgehend gerandet, median nicht zur Apophyse hin eingezogen. Apophyse relativ schmal, neben den Hüften die Seiten etwas verbreitert, aber deutlich ventrad angehoben, dazwischen median mit einer tiefen Furche; hinter den Hüften verschmälern sich die Seiten; apikal zugespitzt und mit einer etwas angehobenen Spitze.

Mesosternum: Kurz, schmal. Vorderrand des hinteren Teils median gering ausgeschnitten, schräg zum herabgedrückten vorderen Teil des Mesosternums abfallend; hinterer Teil auf jeder Seite mit einer flachen Furche.

Metasternum: Sehr stark verkürzt (Abstand zwischen Meso- und Metacoxae deutlich kleiner als Längsdurchmesser der Mesocoxae). Vorderrand zwischen den Mesocoxae verrundet, dick gerandet. Scheibe unpunktiert.

Sternite: Vorderrand des 1. Sternits zwischen den Metacoxae spitzbogig, gerandet. Sternite mit strichigen Strukturen, Punkte sind dadurch nicht zu erkennen.

Fühler: Zurückgelegt kurz vor der Mitte der Flügeldecken endend. Die Längen und Breiten der Antennomeren 1–11 verhalten sich wie 17:7 / 9:5½ / 14:6 / 12:6 / 12:6½ / 12:7 / 13:7½ / 14:7½ / 14:7½ / 14:8 / 20:9.

Beine: Von mittlerer Länge. Femora zum zweiten Drittel hin leicht keulenförmig verdickt. Protibiae apikad etwas verdickt, leicht gekrümmt; an der Innenseite im apikalen Drittel mit einem Feld dicht stehender, borstenartiger Haare (bei den ♀♀!). Mesotibiae apikad verdickt, stärker als die Protibiae gekrümmt, an der Innenseite im apikalen Drittel mit einem Feld dicht stehender, borstenartiger Haare. Metatibiae ähnlich stark wie die Mesotibiae gekrümmt, an der Innenseite im apikalen Drittel mit einem Feld dicht stehender, borstenartiger Haare. Oberseite der Metatarsomeren deutlich behaart. Die Längen der Protarsomeren 1–5 sind 5:4:4:3:18, die der Mesotarsomeren 1–5 sind 5:5:5:5:18, die der Metatarsomeren 1–4 sind 26:11:7:20.

## 6 Anmerkungen zu *Dalmanius* Bremer und Beschreibung einer neuen Art

*Dalmanius* Bremer, 2001: Bremer (2001b: 90–91).
Genotypus: *Dalmanius peregrinus* Bremer, 2001.

Gattungsdiagnose

Kleine bis mittelgroße Arten, deren Oberseite quer sehr stark gewölbt ist. Flügellos. Flügeldecken miteinander verwachsen, mit Punktreihen. Meso- und Metacoxae einander sehr stark genähert. Stirn sehr breit. Rückseiten

der Metatibiae mit stachelartigen Borsten. Mandibeln apikal bifid.

Bisher zwei Arten aus den Bergen von Luzon bekannt: *Dalmanius peregrinus* Bremer, 2001 und *Dalmanius nanus* n. sp.

### *Dalmanius peregrinus* Bremer, 2001 (Abb. 46A–E)

*Dalmanius peregrinus* Bremer, 2001: Bremer (2001b: 90–92).

#### Material

N Luzon, Heightsplan, Philippinen, Boetticher (Holotypus ZSM; Geschlecht nicht untersucht). – Gleiche Funddaten wie Holotypus (2 ♀♀ Paratypen ZSM). – Ich kenne nur die Exemplare der Typenserie.

#### Diagnose

Flügellos, länglich oval, quer sehr stark gewölbt. Seitenrandkanten ganz auf die Unterseite des Körpers verlagert. Scutellum sehr klein. Apikal fallen die Flügeldecken fast senkrecht zum Apexrand ab. Tibiae auch auf der Außenseite borstenartig behaart, auch auf der Oberseite behaarte Tarsen. Flügeldecken mit Punktreihen kleiner, weit auseinander liegender Punkte; Interstitien ziemlich dicht punktiert. Halsschild mit etwas vorragenden Vorderecken, die seitlich hinter der Spitze ausgeschweift sind. Stirn breit.

Bezüglich der Unterschiede zu *Dalmanius nanus* n. sp. siehe bei *D. nanus*.

#### Ergänzende Beschreibung

Maße: Länge 6,05–6,45 mm. Breite 3,74–3,90 mm. – Relationen: Länge/Breite der Flügeldecken 1,32–1,36. Die Längen der Metatarsomeren 1–4 sind 43:8:8:23.

### *Dalmanius nanus* **n. sp.** (Abb. 47A–E)

Holotypus (Geschlecht nicht untersucht): Philippinen, Masoa 70, Aroso (TTM).

#### Etymologie

Nanus (lat.) = Zwerg.

#### Diagnose

Klein, ungeflügelt. Relativ schmal. Halsschild und Flügeldecken quer stark gewölbt. Flügeldecken längs deutlich gewölbt, mit der größten Breite und Höhe etwa in der Mitte. Flügeldecken mit Punktreihen kleiner, wenig auffallender, nicht eingedrückter Punkte, die in einigem Abstand voneinander liegen. Stirn sehr breit. Fühler lang.

Die neue Art *D. nanus* n. sp. ähnelt sehr *Dalmanius peregrinus* Bremer, 2001. *D. peregrinus* ist jedoch wesentlich größer, die Fühler sind bedeutend kürzer, die Punktierung der Interstitien der Flügeldecken ist dichter, die Flügeldecken fallen am Apex steiler ab (siehe Abb. 46B, 47B), und die Form des Halsschildes ist verschieden (Abb. 46C, 47C).

#### Beschreibung

Maße: Länge 4,01 mm. Breite 2,53 mm. – Relationen: Breite/Länge des Halsschildes 1,88; Breite Hinterecken/Breite Vorderecken des Halsschildes 1,49. Länge/Breite der Flügeldecken 1,29; Länge Flügeldecken/Länge Halsschild 3,36; maximale Breite Flügeldecken/maximale Breite Halsschild 1,38.

Farbe: Halsschild braun. Flügeldecken schwarz, leicht opak durch schwache Mikroretikulierung. Unterseite dunkler braun als die hellbraunen Beine und Fühler. Metasternum matt, Sternite glänzend.

Kopf: Stirn und Clypeus deutlich mikroretikuliert. Stirn sehr breit, flach, dicht und klein punktiert. Wangen gering aufgebogen; eine Trennung der Wangen von der Stirn ist nicht auszumachen, da die medialen Teile der Wangen auf derselben Ebene wie die Stirn liegen, und sie wie die Stirn punktiert sind; die Wangen enden vorne etwa auf der Höhe der Stirnnaht. Stirnnaht gering eingeschnitten und eingedrückt. Clypeus kurz, leicht längs gewölbt, wie die Stirn punktiert. Zwischen Vorderrand des Clypeus und Labrum findet sich eine ungewöhnlich breite Membran. Mentum apikad verbreitert, mit verrundeten, planen Seiten; dazwischen querüber gewölbt. Unterseite des Halses vorne mit flachen, großen Punkten. Mandibeln außen gefurcht, apikal bifid.

Halsschild: Kurz. Quer stark gewölbt, längs leicht gewölbt. Hinterecken breit verrundet. Seiten leicht verrundet nach vorne verengt. Vorderecken etwas betont, da der Vorderrand etwas ausgeschnitten ist. Seiten durchgehend schmal gerandet. Randung der Vorderseite breiter als Randung der Seiten, in der Mitte unterbrochen. Bei Aufsicht sind die Randungen der Seiten schmal sichtbar. Bei Ansicht von der Seite sind die Vorderecken stumpfwinklig, ebenso die breit verrundeten Hinterecken. Oberseite mit winzigen, weitläufig stehenden, etwas verwaschenen Pünktchen.

Scutellum: Weitgehend durch den Halsschild verdeckt.

Flügeldecken: Eiförmig, stark gewölbt. Größte Höhe und Breite etwas vor der Mitte. Seitenrandkanten auf die Unterseite verlagert, von oben nicht sichtbar. Enden der Flügeldecken gemeinsam verrundet. Auf der Oberseite Punktreihen mit kleinen, unauffälligen, weit voneinander entfernt stehenden Punkten. Interstitien auf der Scheibe flach, seitlich angedeutet gewölbt, mit wenigen winzigen Pünktchen.

Prosternum: Vorderrand seitlich schmal aufgebogen, median mit einer kurzen, dreieckigen Ausziehung in

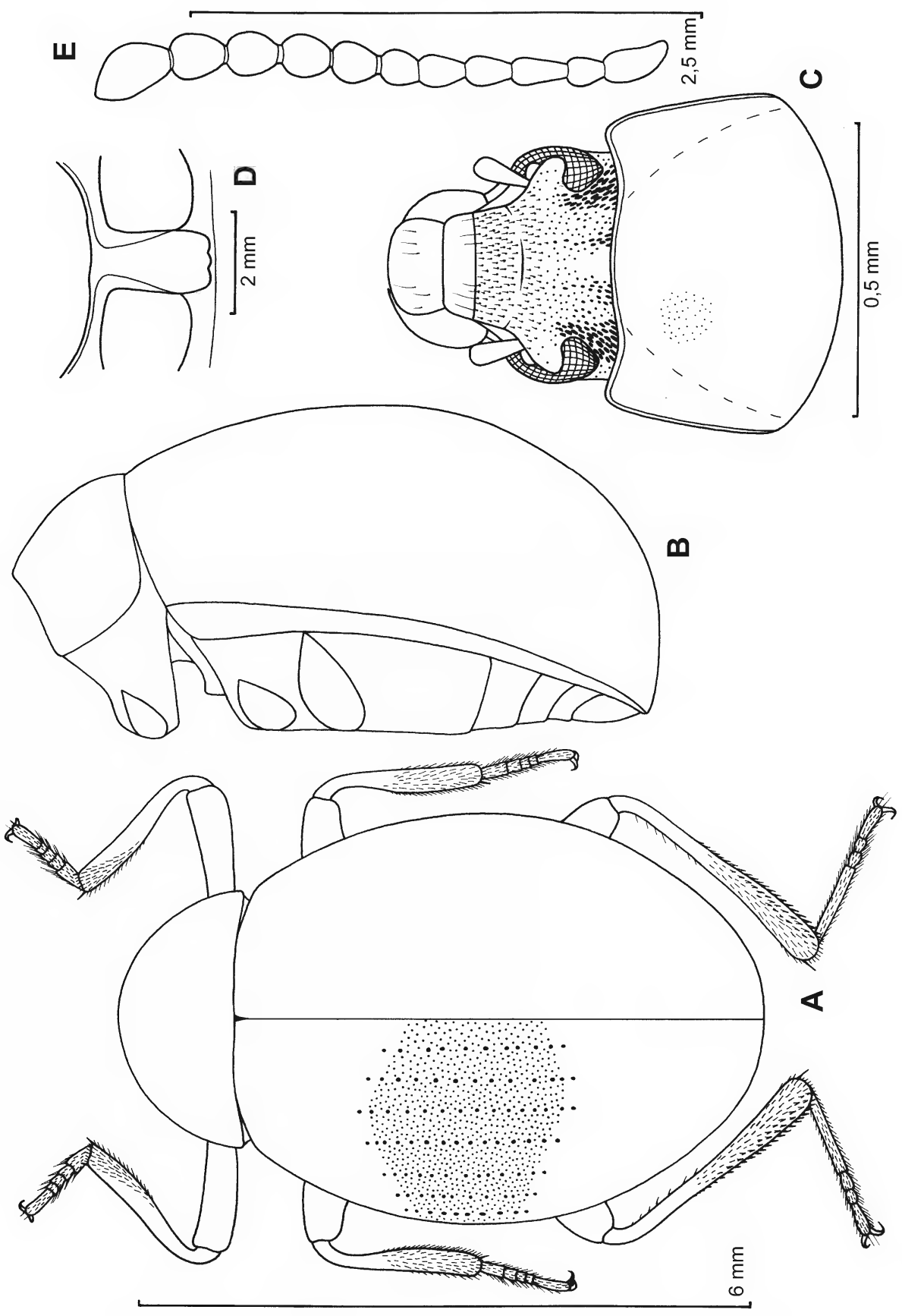


**Abb. 46.** *Dalmanius peregrinus* Bremer, 2001. – **A** Habitus. **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Fühler.

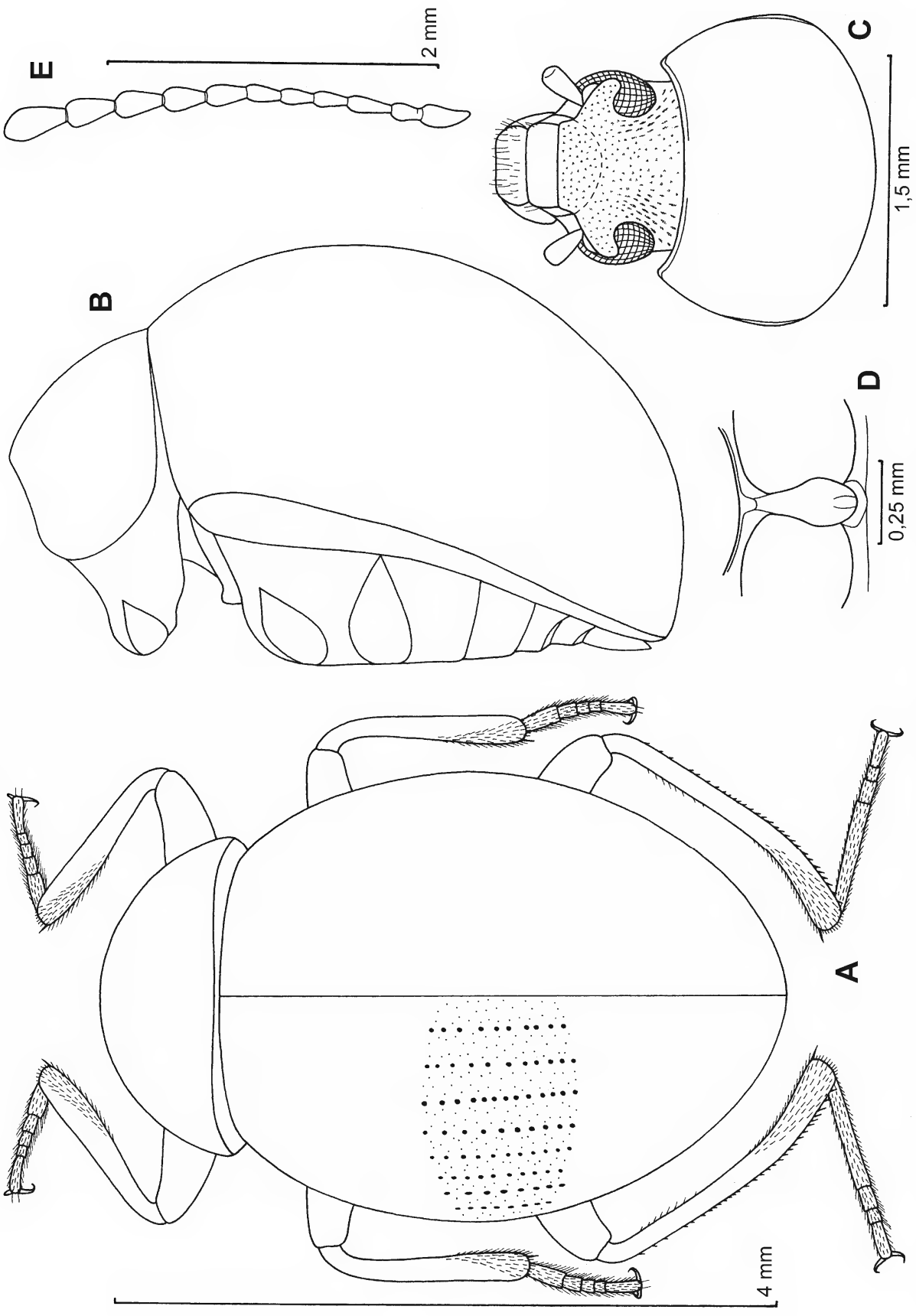


**Abb. 47.** *Dalmanius nanus* n. sp. – **A** Habitus. **B** Körper lateral. **C** Kopf und Halsschild. **D** Prosternalapophyse. **E** Fühler.

Richtung Apophyse. Apophyse ungewöhnlich klein, schmal, von der Form eines hängenden Tropfens, hinter den Hüften herabgebogen.

Mesosternum: Vorderer Teil herabgedrückt. Vorderrand des hinteren Teils median nicht ausgeschnitten, hinterer Teil schmal und etwas angehoben.

Metasternum: Sehr kurz, hinterer Rand der Mesocoxae und vorderer Rand der Metacoxae berühren sich fast. Vorderrand zwischen den Mesocoxae nahezu dreieckig, mit feiner, aufragender Randung. Scheibe hat ungefähr die Form einer Raute, grob punktiert.

Sternite: Sternite mit kleinen Punkten, seitlich mit undeutlichen Fältchen. Sternit 4 extrem kurz.

Fühler: Lang, dünn, im Querschnitt rund, zurückgelegt leicht die Mitte der Flügeldecken überlappend. Die Längen und Breiten der Antennomeren 1–11 verhalten sich wie 17:7 / 7½:5½ / 13:5½ / 10:6 / 10:6 / 10:6 / 11:6 / 13:6½ / 13:7 / 13:7 / 19:7.

Beine: Kurz. Femora ohne eine keulenförmige Verdickung des Schaftes. Protibiae außen leicht konkav, innen mit einer nicht sehr starken Verbreiterung in der apikalen Hälfte; an der Innenseite im apikalen Viertel mit einem Feld dicht stehender, fast anliegender Haare. Mesotibiae außen gerade, innen in der apikalen Hälfte etwas verbreitert, mit ähnlichem Haarfeld wie an der Innenseite der Protibiae. Metatibiae in den basalen drei Fünftel gerade, apikal davon leicht nach innen gekrümmt; an der Außenseite mit kleinen, ziemlich dicht stehenden Stacheln, innen mit feinen, kurzen Haaren. Tarsen kurz. Die Längen der Protarsomeren 1–5 sind 10:4:3:3:11, die der Mesotarsomeren 1–5 sind 9:5:4:4:10, die der Metatarsomeren 1–4 sind 29:4:4:9.

## 7 Anmerkungen zu *Caudamarygmus* Bremer

*Caudamarygmus* Bremer, 2001: Bremer (2001b: 88–89).
Genotypus: *Caudamarygmus notabilis* Bremer, 2001.

### Gattungsdiagnose

Bei den ♂♂ sind die Flügeldecken sehr lang kaudad ausgezogen; bei den ♀♀ sind sie ebenfalls kaudad ausgezogen (über das Übliche hinaus, das solche *Amarygmus*-Arten zeigen, die etwas vorstehende, mukroartige Enden der Flügeldecken aufweisen), aber sie stehen nicht so weit vor wie bei den ♂♂. Profemora ohne Zahn oder klare Stufenbildung an den Vorderseiten. Beine lang und dünn, bei den ♂♂ länger als bei den ♀♀. Seitenrandkanten der Flügeldecken von oben sichtbar. Mandibeln apikal bifid. Der Genotypus ähnelt ansonsten sehr dem auch auf den Philippinen sehr häufigen *A. metallicus* (Perty, 1831).

Eine zweite, unbeschriebene Art dieses Genus kommt auf Neu Guinea vor.

### *Caudamarygmus notabilis* Bremer, 2001 (Abb. 48A–F)

*Caudamarygmus notabilis* Bremer, 2001: Bremer (2001b: 89–90).

#### Material

Philippines, Mindanao, 30 km W of Maramag, 1600 m, 28.–30.XII.1990, Bolm leg. (Holotypus ♂ NHMB). – Gleiche Funddaten wie Holotypus (1 ♂ NHMB). – Mindanao, Misamis occ., Don Victoriano, 1700 m, 1.–3.V.1996, Bolm leg. (1 ♂ Paratypus NHMB, 1 ♂, 1 ♀ Paratypen ZSMB).

#### Diagnose

Groß, länglich oval. Flügeldecken länglich oval, bei den ♂♂ schmaler als bei den ♀♀. Flügeldecken mit Striae, die so schmale Punkte einschließen, dass diese bei normaler Vergrößerung kaum sichtbar sind (schmaler als bei *A. metallicus*, aber ähnlich den Punkten in den Striae von *Amarygmus ovoideus* (Fairmaire, 1882); Interstitien mit extrem feinen, erst bei sehr starker Vergrößerung sichtbaren Pünktchen. Enden der Flügeldecken wie in der Gattungsdiagnose beschrieben, die Fortsätze an den Enden der Flügeldecken lassen an der Innenseite einen längsovalen Raum frei. Halsschild relativ flach, breiteste Stelle meist in der Mitte, nach vorne und hinten leicht eingezogen, vor der Hinterecken leicht ausgeschnitten, Oberseite mit sehr feinen, deutlichen, unregelmäßig stehenden Punkten. Protarsi der ♂♂ nicht verbreitert. Fühler lang und dünn. Weitere Merkmale siehe Abb. 48A–F.

## 8 Anmerkungen zu *Euspinamarygmus* Masumoto

*Euspinamarygmus* Masumoto, 1989: Masumoto (1989: 295–296).
Genotypus: *Euspinamarygmus kaszabi* Masumoto, 1989.

### Gattungsdiagnose

Klein bis mittelgroß (Körperlänge 4,5–11 mm). Geflügelt. Oval bis länglich oval, quer gewölbt; die Gestalt ähnelt der konvexer *Amarygmus*-Arten wie *Amarygmus ovoideus* (Fairmaire, 1882). Schaft der Femora verdickt, an den Vorderseiten der Profemora mit einem scharfen Zahn. Protibiae bei beiden Geschlechtern gleichmäßig und mäßiggradig gebogen (bei einer Art, *E. komiyai* Masumoto, 1989 aus Thailand, auch stark gebogen). Halsschild am breitesten an der Basis, nach vorne verengt, Basis etwa so breit wie die Basis der Flügeldecken, Seiten und Vorderrand des Halsschildes gerandet. Flügeldecken mit Punktreihen oder Striae; Interstitien auf der Scheibe flach. Falsche Epipleuren vollständig und bis zum Apex gleichmäßig entwickelt. Sternit 5 der ♂♂ apikomedian nicht ausgeschnitten. Der Aedoeagus ähnelt dem der meisten *Amarygmus*-Arten.

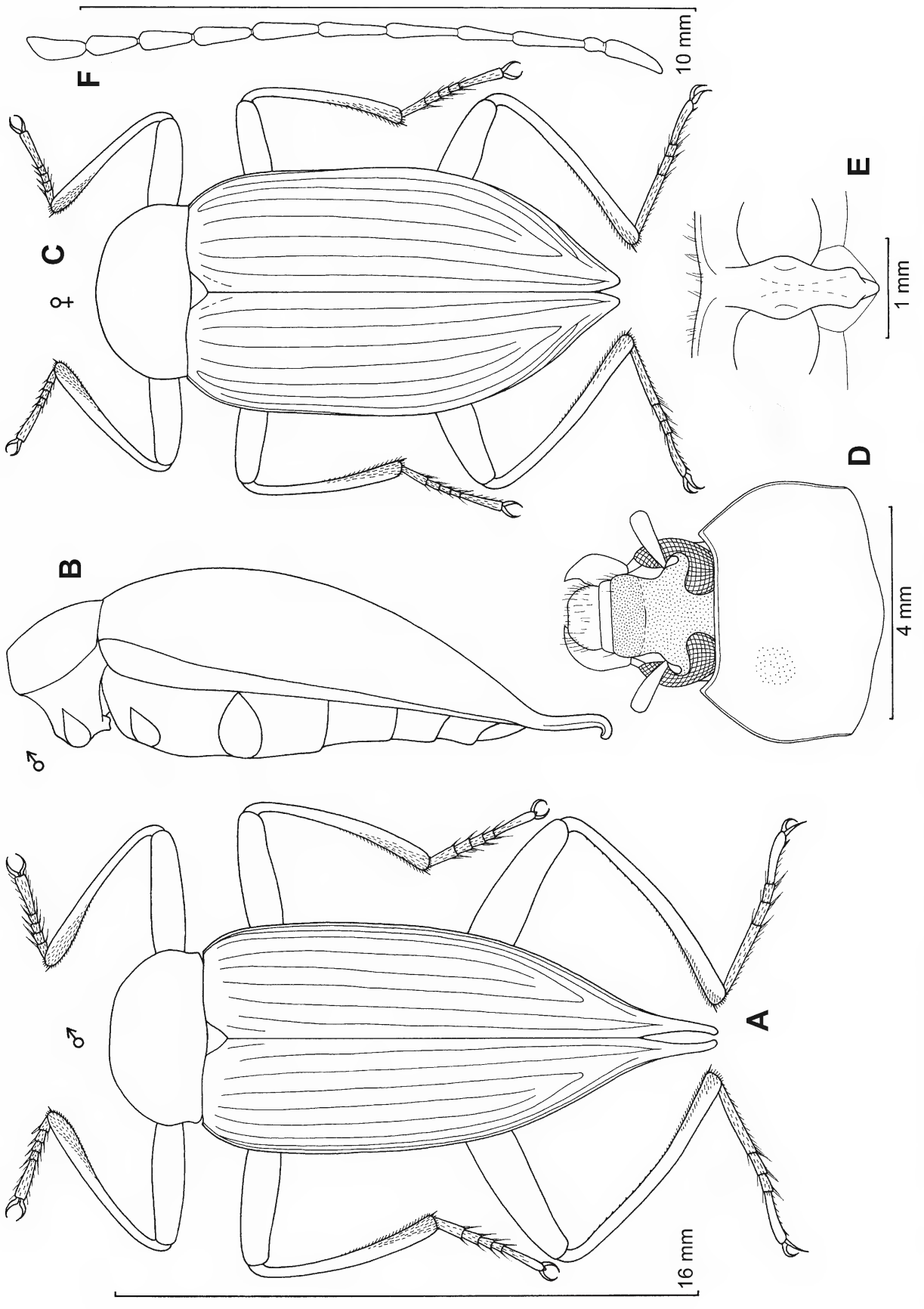


**Abb. 48.** *Caudamarygmus notabilis* Bremer, 2001. – **A** Habitus, ♂. **B** Körper lateral, ♂. **C** Habitus, ♀. **D** Kopf und Halsschild. **E** Prosternalapophyse. **F** Fühler.

### Verbreitung

Von Sri Lanka bis zu den Philippinen.

### Anmerkungen

MASUMOTO (1989) vermerkte, dass diese Gattung heterogene Taxa beherbergt, so dass die taxonomische Stellung der Gattung und ihrer Arten später eine detailliertere Untersuchung notwendig macht. Er stellte *Euspinamarygmus* einstweilen zwischen *Amarygmus* Dalman, 1823 und *Spinamarygmus* Pic, 1915. Von *Amarygmus* unterscheidet sich *Euspinamarygmus* durch das Vorhandensein eines scharfen Zahns an den Vorderseiten der Profemora, von *Spinamarygmus* durch gleichmäßig gebogene Protibiae bei beiden Geschlechtern (Protibiae – und bei einigen Arten auch Mesotibiae – bei den ♂♂ von *Spinamarygmus* abrupt gebogen). Jedoch ist anzumerken, dass auch einige Arten der Gattung *Plesiophthalmus* Motschulsky, 1857 fast oder sogar vollständig die Kriterien der Gattung *Euspinamarygmus* erfüllen, zum Beispiel entsprechen den Kriterien die Arten *Plesiophthalmus keningauensis* Masumoto, 2001 und *P. kimanisensis* Masumoto, 2001 (aus Sabah). Die beiden zuletzt genannten Arten haben außerdem, ebenso wie *Plesiophthalmus cuccodoroi* Masumoto, 2001 (aus Sumatra) und *P. beardae* Masumoto, 1999 (aus Sabah), eine Kopfform mit tiefen Rinnen um die Augen, wie man sie auch bei *Euspinamarygmus minutus* (Pic, 1915) aus Java findet. Es bleibt die Feststellung, dass zumindest bei mehreren Arten von *Plesiophthalmus*, *Euspinamarygmus* und *Spinamarygmus* die Zuweisung zu einem dieser Genera entweder nur unter Zuhilfenahme der männlichen sekundären Geschlechtsmerkmale an den Protibiae oder gar nicht möglich ist. Meine gegenwärtige Meinung ist, dass man die Gattungskriterien von *Plesiophthalmus* etwas ausweiten und die Gattungen *Spinamarygmus* und *Euspinamarygmus* in die Gattung *Plesiophthalmus* einbeziehen sollte. Dies würde auch die Schwierigkeiten lösen, dass man nur die ♂♂, aber nicht die ♀♀, einer dieser Gattungen sicher zuweisen kann. Eine Revision der Gattungen affine *Plesiophthalmus* setzt aber eine erneute Revision aller Arten dieser Gattungen voraus, die ich wahrscheinlich aus Altersgründen nicht mehr durchführen kann. Ich belasse deshalb die Art *Euspinamarygmus philippinensis* einstweilen in der Gattung *Euspinamarygmus*.

## *Euspinamarygmus philippinensis* Masumoto, 1989

*Euspinamarygmus philippinensis* Masumoto, 1989: MASUMOTO (1989: 303–304; Abb. auf S. 301, 313).

### Material

Mt. Apo, South Mindanao, Philippines, VII.1985 (Holotypus ♀ NSMT).

Anmerkung: Es ist nur der Holotypus bekannt, den ich bisher nicht gesehen habe. Die Diagnosen basieren auf der ausführlichen Beschreibung und den Abbildungen von MASUMOTO.

### Diagnose

Mittelgroß (ca. 11 mm). Flügeldecken länglich, größte Breite etwa in der Mitte, gering nach vorne und hinten verschmälert, quer gewölbt. Scheibe der Flügeldecken mit kleinen, länglichen, deutlich auseinander liegenden Punkten; Interstitien flach, mit so winzigen Pünktchen, dass diese erst bei sehr starker Vergrößerung sichtbar sind. Länge/Breite der Flügeldecken ca. 1,4. Halsschild quer deutlich gewölbt, am breitesten an der Basis, nach vorne gebogen verschmälert, Vorderecken annähernd rechteckig, Vorderrand etwas ausgeschnitten, Länge/Breite ca. 2,0, Oberseite ziemlich dicht und unregelmäßig punktiert. Stirnnaht median deutlich eingeschnitten; Oberseite des Kopfes dicht, fein punktiert. Fühler dünn, kurz, zurückgelegt etwa bis zur Basis die Flügeldecken überlappend. Der Zahn an den Vorderseiten der Profemora liegt bei etwa drei Siebtel apikal, er ist spitz und die Spitze nach außen gerichtet. Halsschild und Flügeldecken stark glänzend, mit dunkel grünlichem Schimmer, Flügeldecken an den Schultern und hinten seitlich irisierend.

## 9 Bestimmungstabelle der Arten der philippinischen Amarygmini

Ich habe in diese Bestimmungstabelle *Amarygmus plateni* Pic, 1951 nicht aufgenommen, da mir zum Zeitpunkt der Arbeit an dieser Tabelle der Holotypus nicht vorlag. Die ♀♀ einiger Arten mit wesentlichem Sexualdimorphismus lassen sich mit dieser Tabelle nicht sicher bestimmen.

Man vergegenwärtige sich, dass Bestimmungstabellen artenreicher Gattungen, selbst wenn sie sorgfältig angefertigt wurden, nur bei charakteristischen Arten zu einer sicheren Bestimmung führen. Dieses trifft besonders dann zu, wenn eine größere Zahl weiterer unbeschriebener Arten zu erwarten ist, wenn von vielen Arten nur wenige Exemplare bekannt sind, also die Variabilität innerhalb einer Art nicht abgeschätzt werden kann, und wenn innerhalb dieser Gattungen sehr ähnliche Arten vorkommen. Dieses trifft auf die *Amarygmus*-Arten der Philippinen zu. Man mache sich deshalb bei der Bestimmung von *Amarygmus*-Arten zur Gewohnheit, die fragliche Art stets mit sicher bestimmten Exemplaren zu vergleichen, und nicht nur die Oberseite anzuschauen, sondern – wenn möglich – auch einen Vergleich der Aedoeagus-Formen vorzunehmen (auch bei kleinen Arten!) und eine Bestimmung nur bei sorgfältig gereinigtem und präparierten Material zu versuchen, d. h. die Skulptur, die Beinformen, die Fühlerform und die Stirnbreite müssen beurteilbar sein. Ist der Kopf zu weit in den Thorax eingezogen, um die Stirnbreite zu beurteilen, was häufig bei *Amarygmus*-Arten vorkommt, so trenne ich den Halsschild mit Kopf von dem Rest des Körpers ab und ziehe den Kopf aus dem Thorax heraus. Anschließend kann man auf einem Plättchen die Körperteile wieder zu einer normalen Körperform vereinen.

**1** Vorderseiten der Profemora mit einem deutlichen, vorne spitzen Zahn. – Protibiae beim ♀ gebogen (♂ unbekannt). Oberseite metallisch glänzend mit dunkel grünlichem

Schimmer. Flügeldecken an den Schultern und hinten lateral mit irisierenden Bezirken. Körper länglich oval (Länge/Breite der Flügeldecken 1,4). Fühler filiform, kurz, zurückgelegt die Basis der Flügeldecken erreichend. Auf den Flügeldecken Punktreihen mit kleinen, entfernt voneinander liegenden Punkten. Körperlänge 11 mm. – Mt. Apo, Mindanao. . . . . ***Euspinamarygmus philippinensis*** Masumoto

– Vorderseiten der Profemora ohne Zahn. . . . . **2**

**2** Seitenrandkanten der Flügeldecken auf die Unterseite des Körpers verlagert. Scutellum sehr klein. Ungeflügelt. . . . . **3**

– Seitenrandkanten der Flügeldecken von oben (oder wenigstens in leicht gekippter Position) sichtbar. Scutellum nicht sehr klein. Fast immer geflügelt (nur bei der großen Art *Amarygmus pertyi* findet man neben geflügelten Exemplaren auch solche mit Flügel-Stummeln). . . . . **5**

**3** Große, quer nicht sehr stark gewölbte Art (Körperlänge 10,2–10,8 mm). Flügeldecken nicht zusammengewachsen (einzeln anhebbar). Stirn auffallend breit. Rückseite der Metatibiae ohne borstenartige Haare. – Halsschild ziemlich lang, schmal, auf der Oberseite nur gering gewölbt, Vorderrand stark ausgeschnitten. Flügeldecken länglich oval, Seitenrandkanten von oben nur am Apex sichtbar (an den Schultern etwas kraniad vorgezogen), auf der Oberseite Striae mit kleinen Punkten. Fühlerglieder auch bei den apikalen Antennomeren im Querschnitt rund. Metasternum sehr stark verkürzt. – (Abb. 45). . . ***Luzonoplonyx grandis* n. sp.**

– Deutlich kleiner (Körperlänge 4–6,5 mm). Halsschild und Flügeldecken quer stark gewölbt. Flügeldecken zusammengewachsen (nicht einzeln anhebbar). Stirn breit. Rückseite der Metatibiae mit borstenartigen Haaren. . . . . **4**

**4** Körperlänge 6,1–6,5 mm. Fühler kürzer, zurückgelegt überragt nur ein Fühlerglied die Basis des Halsschildes. Punktierung der Interstitien der Flügeldecken dicht (Abb. 46A). Flügeldecken am Apex steil abfallend (Abb. 46B). Form des Halsschildes siehe Abb. 46C. – Luzon. . . . . ***Dalmanius peregrinus*** Bremer

– Körperlänge ca. 4 mm. Fühler länger, zurückgelegt die Mitte der Flügeldecken überlappend. Punktierung der Interstitien spärlicher (Abb. 47A). Flügeldecken weniger steil abfallend (Abb. 47B). Form des Halsschildes siehe Abb. 47D. – Luzon. . . . . ***Dalmanius nanus* n. sp.**

**5** ♂♂ mit lang nach hinten ausgezogenen Enden der Flügeldecken, die apikal hakenförmig ventrad gebogen sind; bei den ♀♀ sind die Enden der Flügeldecken nicht so stark kaudad verlängert und einzeln verrundet. – Große (Körperlänge 15,4–16,4 mm), flache, länglich ovale Art. Sehr lange, dünne Beine. Auf den Flügeldecken nicht eingeschnittene Striae mit kleinen, sehr eng stehenden Punkten. Stirn mittelbreit. – Mindanao. – (Abb. 48). . . . . ***Caudamarygmus notabilis*** Bremer

– Enden der Flügeldecken nicht weit kaudad vorgezogen, sondern entweder einzeln verrundet und nur gering vorstehend oder gemeinsam verrundet und nicht vorstehend (Arten der Gattung *Amarygmus*). . . . . **6**

**6** Sehr klein (Körperlänge 3,3 mm), flügellos, fast kugelig mit hoch gewölbten, sehr kurzen Flügeldecken (Länge/Breite 1,09) und stark verkürztem Metasternum. Beine ziemlich lang. Auf den Flügeldecken eingeschnittene Striae und etwas gewölbte Interstitien. Stirn sehr breit. Oberseite schwarz, Unterseite braun. – Luzon, Quezon N.P. – (Abb. 31). . . . . ***A. breviculus*** Bremer

– Andere Kombination von Merkmalen. . . . . **7**

**7** Sehr kleine, ovale Arten (Körperlänge 2.8–2.9 mm). . . . . **8**

– Größere Arten (Körperlänge > 4 mm). . . . . **9**

**8** Oval (Länge/Breite der Flügeldecken 1,31). Halsschild, Scutellum und hintere Hälfte der Flügeldecken rotbraun, die vordere Hälfte der Flügeldecken schwarz. Auf den Flügeldecken feine Striae, in denen ab der 3. Stria relativ große Punkte zu finden sind, deren Abstände voneinander etwa dem 1- bis 2-fachen ihrer Durchmesser entsprechen; Interstitien auf der Scheibe leicht, seitlich deutlich gewölbt. Stirn von mittlerer Breite, Stirnnaht nicht furchenartig eingeschnitten. – Leyte. – (Abb. 42). . . . . ***A. schawalleri*** Bremer

– Flügeldecken kürzer oval (Länge/Breite der Flügeldecken 1,23). Halsschild und Stirn grünblau, Flügeldecken einheitlich grüngolden, stark glänzend. Auf den Flügeldecken Punktreihen mit kleinen Punkten, die weit voneinander stehen und im Apikalbereich verlöschen (in der 4. Reihe etwa 18 Punkte); Interstitien absolut plan, unpunktiert. Stirn breit, Stirnnaht furchenartig eingeschnitten. – Sulu Archipel, Insel Tawi Tawi. – (Abbildungen siehe Bremer 2001c: 10). . . . . ***A. fragilis*** Bremer

**9** Grundfarbe schwarz; auf jeder Flügeldecke drei große, rotgelbe Makeln, von denen die vorderen zwei durch ein schwarzes Längsband entlang der Naht getrennt werden; die übergreifende rotgelbe Makel am Apex ist median nicht voneinander getrennt. – Mittelgroße, länglich ovale Art. Halsschild und Kopf schwarz. Interstitien der Flügeldecken flach. Striae auf den Flügeldecken. Vorderbeine der ♂♂ sehr viel länger als die der ♀♀, mit stark verbreiterten Protarsomeren 1–3 und weit nach außen vorstehenden Haaren an diesen Tarsen. Fühler der ♂♂ wesentlich länger als die der ♀♀. Körperlänge 6,6–8,6 mm. – Mindanao. – (Abb. 29). . . . . ***A. allectorius*** Bremer

– Flügeldecken ohne rotgelbe Makeln. . . . . **10**

**10** Flügeldecken apikal etwas mukroartig vorstehend (bei einer Art, *A. pseudometallicus* n. sp., zur Naht hin eingezogen und nur sehr wenig vorstehend). – Große, flache Arten. Auf den Flügeldecken Striae aus feinen, sehr eng stehenden Punkten; Interstitien flach. Halsschild nach hinten entweder etwas eingezogen oder subparallel. Oberseite glänzend schwarz oder dunkel metallisch. . . . . **11**

– Flügeldecken gemeinsam verrundet, ohne mukroartig vorstehende Enden. . . . . **13**

**11** Begrenzung der etwas vorgezogenen Enden der Flügeldecken bei den ♂♂ mehr oder weniger gerade, bei den ♀♀ verrundet. Seiten des Halsschildes nach hinten stärker eingezogen als bei den folgenden Arten. Interstitien der Flügeldecken fein, aber deutlich punktiert. Metasternum kürzer als bei den folgenden Arten. – Spitze des Aedoeagus ventrad gebogen. Es gibt sowohl flügellose als auch geflügelte Exemplare. Körperlänge 9,2–12,0 mm. – Luzon, Boac. – (Abb. 38). . . . . ***A. pertyi*** Bremer (Die ♀♀ von *Caudamarygmus notabilis* sind sehr ähnlich den ♀♀ von *A. pertyi*, aber die vorgezogenen Enden der Flügeldecken stehen bei *C. notabilis* noch etwas weiter kaudad vor als bei *A. pertyi*.)

– Enden der Flügeldecken bei beiden Geschlechtern einzeln verrundet (Abb. 37A). Seiten des Halsschildes in der hinteren Hälfte meist subparallel. Interstitien der Flügeldecken wesentlich feiner punktiert als bei der vorigen Art. Metasternum von normaler Länge. . . . . **12**

**12** Flügeldecken länglicher und flacher als bei der folgenden Art, größte Breite und Höhe knapp vor der Mitte; Striae fein und eng punktiert, die Punkte aber gut sichtbar; Seitenrandkanten von oben in der ganzen Länge schmal sichtbar. Seiten des Halsschildes in der vorderen Hälfte eingezogen. Metatibiae bei beiden Geschlechtern gebogen. Spitze des Aedoeagus leicht dorsad gebogen. Körperlänge 9,5–12,1 mm. – Weit verbreitert in der orientalischen Region, Molukken, alle Inseln der Philippinen. – (Abb. 37). . . . . ***A. metallicus*** (Perty)

– Größte Breite und Höhe der Flügeldecken zu Beginn des

zweiten Drittels, wo die Wölbung fast buckelartig ist; Striae so fein punktiert, dass die Punkte erst bei starker Vergrößerung sichtbar werden (ähnlich den Striae des in der orientalischen Region häufigen, aber auf den Philippinen nicht vorkommenden *A. ovoideus*); Seitenrandkanten nur am Apex von oben sichtbar. Seiten des Halsschildes anders. Metatibiae der ♂♂ gerade. Aedoeagus anders. Körperlänge 8,3 mm. – Mindanao. – (Abb. 24). . . . . ***A. pseudometallicus* n. sp.**

**13** Kleine bis mittelgroße Arten (Körperlänge 4,4–6,1 mm) mit sehr langgestreckten, schmalen Flügeldecken (Länge/Breite 1,62–1,76); größte Breite der Flügeldecken nach etwa einem Fünftel der Länge, dahinter leicht gebogen verengt (Abb. 10A, 23A). Protarsomeren 1–3 der ♂♂ leicht verbreitert. – Fühler von mittlerer Länge, bei den ♂♂ etwas länger als bei den ♀♀. . . . . **14**

– Wenn ähnlich klein, dann die Flügeldecken nicht so langgestreckt. Bei den größeren Arten sind die Flügeldecken entweder nicht so langgestreckt, oder, wenn sie langgestreckt sind, dann die ♂♂ mit sehr stark verbreiterten Protarsomeren 1–3. . . . . **15**

**14** Kleine Art (Körperlänge 4,4–5,3 mm). Auf den Flügeldecken sowohl zarte Striae mit kleinen, unauffälligen Punkten als auch einzelne, allein stehende, kleine Punkte. Halsschild und Scheibe der Flügeldecken einheitlich braun, Halsschild mit farbigen Reflexionen, auf den Flügeldecken die seitlichen Interstitien nach medial nicht sehr intensiv blaugrün bis rötlich gefärbt. Stirn ziemlich breit. Innenseite der Metatibiae der ♂♂ nach dem basalen Viertel plötzlich verbreitert. – Luzon. – (Abb. 23). . . . . ***A. prolixus* n. sp.**

– Größere Art (Körperlänge 5,7–6,1 mm). Striae auf den Flügeldecken durchgehend, mit kleinen Punkten, die in einiger Entfernung voneinander liegen. Oberseite dunkel kupfrig, matt, mit nicht sehr intensiven, farbigen Reflexionen. Stirn deutlich schmaler als bei der vorigen Art. Fühler nicht sehr lang, bei den ♂♂ etwas länger als bei den ♀♀. Innenseite der Metatibiae der ♂♂ ohne plötzliche Erweiterung. – Luzon. – (Abb. 10). . . . . ***A. iuventus* n. sp.**

**15** ♂♂ mit sehr stark verbreiterten Protarsomeren 1–3 (z. B. Abb. 30A). . . . . **16**

– Protarsomeren 1–3 der ♂♂ leicht oder gar nicht verbreitert. . . . . **28**

**16** Striae auf den Flügeldecken. . . . . **17**

– Punktreihen auf den Flügeldecken. . . . . **21**

**17** Flügeldecken mit tief eingeschnittenen Striae und deutlich gewölbten Interstitien. – Flügeldecken mit diskreten, farbigen Längsstreifen. Mesotibiae im basalen Drittel leicht gekrümmt. Stirn ziemlich schmal. Große Art (Körperlänge ca. 11 mm). – Luzon. – (Abb. 33). . . . . ***A. elytralis*** Bremer

– Striae der Flügeldecken zart, so dass die Interstitien auf der Scheibe nicht oder nur unwesentlich gewölbt sind. . . . . **18**

**18** Halsschild schwarz, kaum glänzend. – Flügeldecken mit farbigen Längsstreifen auf nicht wesentlich glänzendem Grund. Beine, Fühler, Kopf und Unterseite schwarz. Stirn ziemlich schmal (schmaler als bei den folgenden Arten *A. angustus* und *A. bakeri*). Fühler ziemlich kurz. Auf den Flügeldecken gereiht ziemlich große, längliche, tief eingeschnittene Punkte, die durch zarte Linien miteinander verbunden sind. Körperlänge ca. 7,3 mm. – Negros. – (Abb. 8). . . . . ***A. eremitis* n. sp.**

– Halsschild nicht schwarz, sondern verschiedenfarbig oder blau. . . . . **19**

**19** Art mit feinen Striae auf den Flügeldecken, in ihnen kleine Punkte. Halsschild farbig in den Spektralfarben, glänzend. Auf den Flügeldecken diskrete farbige Längsstreifen. Oberseite stark mikroretikuliert, dadurch herabgesetzter Glanz. Halsschild ziemlich breit und quer gering gewölbt. Fühler nicht sehr lang. Beine schwarz. Auf der Dorsalseite des Aedoeagus findet sich kein helmartiger Buckel, der vom Spitzenteil kurz auf den Basalteil übergreift. Körperlänge 8,1–9,5 mm. – Luzon, Negros. – (Abb. 30). . . . . ***A. angustus*** Gebien

– Andere Kombination von Merkmalen. . . . . **20**

**20** Größere Art (Körperlänge 7,3–7,9 mm). Oberseite rotbraun bis grün, metallisch glänzend, Halsschild und Flügeldecken mit queren Reflexionen in den Spektralfarben. Beine braun bis dunkelbraun. Punkte der Striae mittelgroß; Interstitien der Flügeldecken auf der Scheibe leicht, seitlich deutlich gewölbt, fein, aber nicht sehr dicht punktiert. Länge/Breite der Flügeldecken 1,67–1,73. Protarsomeren 1–3 der ♂♂ sehr breit. Dorsalseite des Aedoeagus median im hinteren Teil des Spitzenteils mit helmartiger Erhöhung, die etwas auf den Basalteil übergreift. – Luzon. – (Abb. 4). . . ***A. bakeri* n. sp.**

– Kleiner (Körperlänge 4,9–5,4 mm). Flügeldecken einheitlich blau, Halsschild etwas dunkler. Beine schwarzbraun. Die Abstände der Punkte in den Striae auf der Scheibe entsprechen etwa den Punktdurchmessern; Interstitien der Flügeldecken ziemlich dicht und fein punktiert. Länge/Breite der Flügeldecken 1,44–1,48. Protarsomeren 1–3 der ♂♂ sehr stark (aber apikad mit abnehmender Tendenz) verbreitert. Aedoeagus anders. – Leyte. – (Abb. 22). . . . . ***A. platolenoides* n. sp.**

**21** Körperlänge 5,1–5,3 mm. – Länge/Breite der Flügeldecken 1,48–1,58. Auf den Flügeldecken Punktreihen mit großen, weit voneinander entfernt stehenden Punkten (in der 4. Reihe etwa 20 Punkte); Interstitien flach, mit winzigen, weitläufig stehenden Punkten. Oberseite mikroretikuliert und dadurch Glanz herabgesetzt, je nach Winkel des Lichteinfalls in einer anderen Farbe reflektierend. Beine schwarzbraun. Protarsomeren 1–3 der ♂♂ sehr breit (nicht die Mesotarsomeren 1–3). – Mindanao. – (Abb. 15). . . . . ***A. mindanaensis* n. sp.**

– Körperlänge > 7,0 mm. . . . . **22**

**22** Punktreihen der Flügeldecken mit sehr großen, weit auseinander liegenden Punkten (in der 4. Reihe etwa 11 Punkte). – Interstitien der Flügeldecken schmal. Stirn ziemlich breit. Oberseite farbig metallisch. Protarsomeren 1–3 beim ♂ stark verbreitert. Körperlänge ca. 7,9 mm. – Mindanao. – (Abb. 9). . . . . ***A. hylaeus* n. sp.**

– Punkte der Punktreihen der Flügeldecken kleiner und enger stehend (in der 4. Reihe > 17 Punkte). . . . . **23**

**23** Beine hellbraun bis kastanienbraun, zur schwarzen Körperunterseite kontrastierend. – Flügeldecken dunkelgrün, gering glänzend. Halsschild grün, mit deutlichen purpurnen Reflexionen, deutlich glänzend. Punkte auf den Flügeldecken mittelgroß und nicht sehr eng positioniert (etwa 24 Punkte in der 4. Reihe). Seiten der Flügeldecken subparallel. Scheibe der Flügeldecken und des Halsschildes quer und längs wenig gewölbt. Halsschild sehr breit (Breite/Länge 2,07–2,19), mit winzigen, schütter stehenden Punkten. Metatarsomer 1 deutlich kürzer als die Metatarsomeren 2–4 zusammen. Körperlänge 9,1–9,5 mm. – Luzon. – (Abb. 34). . . . . ***A. inversus*** Bremer

– Beine dunkelbraun bis schwarz, kein Farbkontrast zur Körperunterseite. . . . . **24**

**24** Flügeldecken ohne farbige Längsstreifen. – Punkte der Punktreihen der Flügeldecken mittelgroß bis groß, Abstände zwischen ihnen groß (etwa 17–25 Punkte in der 4. Reihe). Beine dunkelbraun bis schwarz. . . . . **25**

– Flügeldecken mit farbigen Längsstreifen. . . . . **26**

**25** Fühler lang, dünn, zurückgelegt etwa die Mitte der Flügeldecken erreichend, schwarz. Halsschild etwas glänzend. Körper länglich oval. Halsschild von mittlerer Breite (Breite/Länge 1,73–1,84), mit kleinen, aber deutlich wahr-

nehmbaren Punkten. Etwa 24 Punkte in der 4. Reihe der Flügeldecken. Stirn mittelbreit. Oberseite etwas glänzend, unterschiedlich gefärbt (man findet sowohl einheitlich grün oder hellviolett gefärbte Exemplare als auch solche mit grünblauem Halsschild und messingfarbenen Flügeldecken). Unterseite, Femora und Tibiae schwarz. Protarsomeren 1–3 der ♂♂ stark verbreitert. Spitze des Aedoeagus leicht dorsad flektiert. Körperlänge 8,0–9,3 mm. – Samar, Mindanao. – (Abb. 35). ..... ***A. latipes*** (Kulzer)

– Fühler deutlich kürzer, zurückgelegt etwa das erste Drittel der Flügeldecken überlappend, braun. Halsschild matt, schwarz. Ähnliche Körperform wie bei der vorigen Art, aber Flügeldecken kürzer (Länge/Breite 1,54–1,71). Etwa 17 Punkte in der 4. Reihe der Flügeldecken. Stirn breiter. Flügeldecken blaugrün, leicht glänzend. Unterseite braun, Beine dunkelbraun. Protarsomeren 1–3 der ♂♂ etwas weniger verbreitert. Spitze des Aedoeagus (in seitlicher Ansicht) gerade. Körperlänge 7,4–8,1 mm. – Luzon. – (Abb. 6). ..... ***A. dembickyi*** **n. sp.**

**26** Flügeldecken mit Punktreihen mittelgroßer bis großer Punkte, die in einigem Abstand voneinander stehen (etwa 24 Punkte in der 4. Reihe). – Halsschild grün, glänzend. Flügeldecken mit grünen und purpurnen Längsstreifen. Bei den ♂♂ an den Hinterseiten der Meso- und Metafemora mit langen, abstehenden Haaren. Länge/Breite der Flügeldecken 1,59–1,62. Protarsomeren 1–3 der ♂♂ stark verbreitert. Körperlänge 8,0–9,7 mm. – Samar, Tangolan [= Tangcolan?]. – (Abb. 32). ..... ***A. coloratus*** (Kulzer)

– Flügeldecken mit Punktreihen ziemlich dicht stehender, mittelgroßer Punkte (etwa 48–50 Punkte in der 4. Reihe). . . **27**

**27** Relativ lange, schmale Flügeldecken (Länge/Breite 1,58). Oberseite glänzend, je nach Winkel des Lichteinfalls in verschiedenen Farben reflektierend, Längsstreifen auf den Flügeldecken grün und purpurn. Punktreihen der Flügeldecken auf der Scheibe nicht eingedrückt (etwa 48 Punkte in der 4. Reihe); Interstitien nicht gewölbt. ♂♂ an den Hinterseiten der Meso- und Metafemora mit langen, abstehenden Haaren und Protarsomeren 1–3 stark verbreitert. Lange, dünne Fühler. Körperlänge 12,4 mm. – Luzon. – (Abb. 41). . ..... ***A. pulcher*** (Kulzer)

– Flügeldecken kürzer und breiter (Länge/Breite ca. 1,40). Halsschild grün mit rötlichen Reflexionen, Längsstreifen auf den Flügeldecken grün, gelb und purpurn. Flügeldecken mit Punktreihen mittelgroßer, dicht beieinander liegender Punkte, die in etwas eingedrückten Reihen liegen, so dass Striae vorgetäuscht werden (etwa 50 Punkte in der 4. Reihe); Interstitien auf der Scheibe etwas, seitlich deutlich gewölbt. Protarsomeren 1–3 beim ♀ etwas verbreitert (♂♂ bisher nicht bekannt). Fühler mittellang, nicht ausgesprochen dünn. Körperlänge 12,6 mm. – Luzon. – (Abb. 27). ..... ***A. vicarius*** **n. sp.**

**28** Striae tief eingeschnitten und Interstitien stark gewölbt. – Flügeldecken mit deutlichen farbigen Längsstreifen. Protarsomeren 1–3 der ♂♂ leicht verbreitert. Mesotibae im basalen Drittel verrundet abgeknickt. Stirn ziemlich breit. Fühler ziemlich kurz. Körperlänge 7,2–7,3 mm. – Luzon. – (Abb. 18). ..... ***A. notabilis*** **n. sp.**

– Arten ohne tief eingeschnittene Striae und stark gewölbte Interstitien. ..... **29**

**29** Mittelgroße bis große (Körperlänge > 7,4 mm), länglich ovale Arten. Protarsomeren 1–3 bei den ♂♂ nicht oder nur leicht verbreitert. Fühler (ausgenommen *A. notabilis* und *A. cuprarius*) sehr lang und dünn. Flügeldecken meist nicht sehr stark gewölbt. Einige Arten haben bei den ♂♂ an den Hinterseiten der Meso- und Metafemora lange, schräg abstehende, dünne Haare; eine Art hat bei den ♂♂ ein dicht behaartes Metasternum. ..... **30**

– Meist kleiner; wenn etwas größer als 7,4 mm, dann von ovaler (und nicht länglich ovaler) Körperform. ..... **38**

**30** Auf den Flügeldecken finden sich Reihen von Punkten, die deutlich voneinander getrennt sind. Protarsomeren 1–3 der ♂♂ nicht verbreitert. ..... **31**

– Auf den Flügeldecken finden sich entweder durchgehende Striae, Punktreihen etwas getrennt voneinander liegender Punkte, die durch zarte Striche meist miteinander verbunden sind (Abb. 11A) oder Punktreihen so dicht stehender Punkte, dass diese wie Striae erscheinen. Protarsomeren 1–3 der ♂♂ leicht oder nicht verbreitert. ..... **32**

**31** Stirn relativ breit. Interstitien der Flügeldecken unpunktiert. ♂♂ an den Hinterseiten der Meso- und Metafemora ohne lange Haare. Oberseite braun metallisch. Beine und Fühler braun. Körperlänge ca. 8,5 mm. – Luzon. – (Abb. 1). ..... ***A. abiectus*** **n. sp.**
(*A. plateni* besitzt eine ähnlich breite Stirn).

– Stirn schmal. Interstitien der Flügeldecken fein und weitläufig punktiert. ♂♂ an den Hinterseiten der Meso- und Metafemora in der basalen Hälfte mit langen Haaren. Halsschild bei einem Exemplar purpurn, in grün changierend. Flügeldecken bei Aufsicht grün, mit leichtem Farbspiel, bei schräger Ansicht purpurn, mit grünlicher Komponente. Beine und Fühler schwarz. Körperlänge 9,6–11,1 mm. – Leyte. – (Abb. 3). ..... ***A. antiquus*** **n. sp.**

**32** Große, flache Art mit farbiger Oberseite, die je nach Einfallswinkel in verschiedenen Farben reflektiert; auf den Flügeldecken nicht sehr intensive farbige Längsstreifen. Flügeldecken mit eingedrückten Striae, die aus vielen, eng gesetzten, kleinen Punkten bestehen; Interstitien auf der Scheibe annähernd flach, sehr dicht und klein punktiert. Halsschild dicht und klein punktiert. Stirn ziemlich eng. Protarsomeren der ♂♂ nicht verbreitert. Körperlänge 9,7–11,9 mm. – Alle philippinischen Inseln, von Nepal bis zu den südlichen Molukken. – (Abbildungen siehe Bremer 2005b: 55). ..... ***A. cuprarius*** (Weber)

– Andere Kombination von Merkmalen. ..... **33**

**33** Halsschild und Flügeldecken verschiedenfarbig (Halsschild entweder grün-purpurn oder blau, Flügeldecken entweder grün oder mit einer gelblichen Färbung, die sich auch von Interstitium zu Interstitium unterscheiden kann). – Interstitien gewölbt, fein, deutlich, aber nicht sehr eng punktiert. ♂♂ an der Hinterseite der Meso- und Metafemora in der basalen Hälfte mit langen Haaren. Körperlänge 11,4–14,1 mm. – Sibuyan, Marinduque, Luzon, Mindanao. – (Abb. 40). ..... ***A. planipennis*** (Kulzer)

– Halsschild und Flügeldecken einheitlich gefärbt (bei einer Art stark farbig), der Halsschild kann etwas dunkler als die Flügeldecken sein. ..... **34**

**34** Sehr groß (Körperlänge > 11 mm). ..... **35**

– Kleiner (< 10 mm). ..... **36**

**35** Stirn sehr schmal, Breite entspricht etwa dem Durchmesser von zwei Ocellen der Augen (Abb. 43C). Auf den Flügeldecken leicht eingeschnittene Striae mit sehr dicht stehenden, kleinen Punkten; Interstitien auf der Scheibe angedeutet, seitlich deutlich gewölbt, mit feinen, ziemlich dicht stehenden Punkten. Oberseite dunkelgrün bis braun. Körperlänge 11,9–12,2 mm. – Luzon. – (Abb. 43). ..... ***A. spectabilis*** (Gebien)

– Stirn etwas breiter (Abb. 11C). Auf den Flügeldecken gereiht ziemlich große, zum Teil rhombische Punkte, die durch feine Linien miteinander verbunden sind; Abstände der Punkte voneinander unterschiedlich, einige sind einander sehr stark genähert, andere haben einen Abstand voneinander, der dem 3-fachen der Punktdurchmesser entspricht; Interstitien auf der Scheibe flach, seitlich sehr leicht gewölbt, mit winzigen Punkten. Flügeldecken dunkel kupferfarben,

Halsschild etwas dunkler. Körperlänge ca. 11,1 mm. – Leyte. – (Abb. 11). ..... ***A. jaegeri* n. sp.**

**36** Oberseite sehr stark glänzend, kupfrig; Flügeldecken in den hinteren Teilen mit deutlichen, queren Reflexionen in den Regenbogenfarben. Flügeldecken mit feinen Striae und in ihnen dicht stehende, mittelgroße Punkte; Interstitien auf der Scheibe eben, mit winzigen, nicht sehr dicht stehenden, aber gut sichtbaren Punkten. Flügeldecken quer deutlich gewölbt. – Stirn schmal, etwa von der Breite des Durchmessers von zwei Ocellen. Fühler lang und dünn. Protarsomeren der ♂♂ leicht verbreitert. Metasternum (aber nicht die Sternite) bei den ♂♂ dicht punktiert und behaart. Körperlänge 9,1–9,9 mm. – Luzon, Boac, Leyte, Mindanao. – (Abb. 44). ..... ***A. trichosternum*** Gebien

– Oberseite nicht stark glänzend, ohne oder mit sehr schwachen farbigen Reflexionen. Striae aus kleinen Punkten bestehend; Interstitien fein und dicht punktiert; Flügeldecken gering gewölbt. ..... **37**

**37** Körperlänge 8,9–9,6 mm. Flügeldecken länglich (Länge/Breite 1,46–1,48). Metasternum der ♂♂ dicht und fein punktiert, mittellang behaart; Rückseiten der Meso- und Metafemora der ♂♂ mit langen, zarten Haaren. Punktierung der Sternite dicht. Metatarsomeren kürzer als bei der folgenden Art. Oberseite bei Tageslicht mit mäßigem Glanz, kupfrig mit leicht purpurnen Schimmer, mit sehr leichten farbigen Reflexionen in den hinteren Partien der Flügeldecken. Beine schwarz. – Negros. – (Abb. 16). ..... ***A. negrosensis* n. sp.**

– Etwas kleiner als die vorige Art (7,4–7,9 mm). Flügeldecken etwas kürzer (Länge/Breite 1,39–1,43). Metasternum der ♂♂ kahl; keine langen Haare an den Rückseiten der Meso- und Metafemora. Punktierung der Sternite schütterer. Tarsomeren (besonders die Metatarsomeren) lang und dünn. Oberseite braun metallisch. Beine und Fühler braun. – Luzon, Leyte. – (Abb. 36). ..... ***A. longitarsis*** Gebien

**38** Ovale, mittelgroße Arten (Körperlänge 7,2–8,3 mm). Fühler dünn, Antennomeren 7–10 apikad nur gering verbreitert (Abb. 39E). Stirn mittelbreit. Interstitien der Flügeldecken fein, aber deutlich punktiert. Protarsomeren 1–3 der ♂♂ nicht verbreitert. ..... **39**

– Andere Kombination von Merkmalen. Antennomeren 7–10 von basal nach apikal deutlich verbreitert. Körperform und Punktierung der Flügeldecken anders. ..... **42**

**39** Arten mit Punktreihen auf den Flügeldecken, d. h. die Punktreihen sind nicht eingedrückt, und die Punkte der Punktreihen sind nicht durch feine Striche miteinander verbunden. Interstitien der Flügeldecken auf der Scheibe nicht gewölbt. ..... **40**

– Arten mit etwas eingedrückten Punkten in Reihen, die durch feine Striche miteinander verbunden sind, d. h. es liegen Striae vor. Interstitien der Flügeldecken auf der Scheibe mehr oder weniger deutlich gewölbt. ..... **41**

**40** Halschild und Flügeldecken einheitlich anthrazitfarben. Vorderrand des Halsschildes kaum ausgeschnitten, dadurch die Vorderecken nicht so spitz vorstehend. Körperlänge 7,2–8,1 mm. – Luzon, Mindoro, Palawan. – (Abb. 39). ..... ***A. philippinensis*** Gebien

– Halsschild blau, Flügeldecken je nach Winkel des Lichteinfalls von purpurfarben bis schmutziggrün wechselnd. Vorderrand des Halsschildes stärker ausgeschnitten, so dass die Vorderecken spitzer vorstehen als bei der vorigen Art. Körperlänge 7,3–8,1 mm. – Romblon. – (Abb. 12). ..... ***A. langeri* n. sp.**

**41** Oberseite gleichmäßig blaugrün. Körperlänge ca. 7,6 mm. – Panay. – (Abb. 25). ..... ***A. rugipectus* n. sp.**

– Halsschild grün, Flügeldecken dunkel purpurfarben. Körperlänge 7,2–8,3 mm. – Negros. – (Abb. 28). ***A. vulcanus* n. sp.**

**42** Kleine bis mittelgroße, ovale Arten mit Punktreihen auf den Flügeldecken. ..... **43**

– Kleine bis mittelgroße Arten mit Striae auf den Flügeldecken. ..... **48**

**43** Ziemlich große Art (Körperlänge 8,9–10,0 mm). – Breit, mit Punktreihen sehr großer Punkte auf den Flügeldecken, so dass die Interstitien nicht breiter als die Punkte der Reihen sind (in der 4. Reihe etwa 15 Punkte). Flügeldecken quer und längs stark gewölbt; Interstitien nicht gewölbt, unpunktiert. Länge/Breite der Flügeldecken 1,32–1,38. Beine kurz, dünn. Fühler mittellang, sehr dünn. Stirn mittelbreit. Halsschild anthrazitfarben, gering glänzend. Flügeldecken dunkelgrün, leicht glänzend. Beine und Fühler rotbraun. – Luzon. – (Abb. 21). ..... ***A. paradoxus* n. sp.**

– Deutlich kleiner (< 6,5 mm). ..... **44**

**44** Auf den Flügeldecken finden sich in den Punktreihen kleine, unscheinbare Punkte, die in einigem Abstand voneinander liegen. Flügeldecken schwarz, matt durch starke Mikroretikulierung. – Femora und Tibiae schwarzbraun bis schwarz. Antennomeren 5–11 mit sehr schmaler Basis und breitem Apex, so dass die Fühler sehr deutlich segmentiert sind. Protarsomeren 1–3 der ♂♂ verlängert und etwas verbreitert. Körperlänge 6,4 mm. – Luzon. – (Abb. 13). ..... ***A. lugubris* n. sp.**

– Punkte der Punktreihen nicht ausgesprochen klein und unauffällig. Flügeldecken nicht schwarz und nicht stark mikroretikuliert. ..... **45**

**45** Oberseite dunkelbraun oder anthrazitfarben. – Auffällig durch den Kontrast zwischen dunkler Oberseite und den gelbbraunen Tibiae und Fühlern. Halsschild leicht, Flügeldecken deutlich mikroretikuliert, dadurch herabgesetzter Glanz. Leicht länglich oval (Länge/Breite der Flügeldecken 1,36–1,46). Fühler mittellang. Stirn ziemlich breit (breiter als die Länge des 3. Antennomers). Körperlänge 5,3–6,1 mm. – Luzon. – (Abb. 26). ..... ***A. schultzei* n. sp.**

– Oberseite farbig. ..... **46**

**46** Stirnnaht tief, furchenartig und durchgehend eingeschnitten. Interstitien der Flügeldecken mit feinen, nicht sehr dicht stehenden Punkten. Prosternalapophyse ziemlich breit und kurz. Fühler etwas länger als bei den folgenden Arten. – Halsschild und Stirn blaugrün, Flügeldecken je nach Winkel des Lichteinfalls in verschiedenen Farben glänzend (aber ohne die Tendenz, dass sich die Farben in Längsstreifen ordnen). Punkte der Reihen der Flügeldecken klein. Deutlich oval, Länge/Breite der Flügeldecken 1,22–1,30. Körperlänge 5,7–6,4 mm. – Mindanao. – (Abb. 7). ..... ***A. dissimilis* n. sp.**

– Stirnnaht etwas eingedrückt, aber nicht tief und durchgehend eingeschnitten. Interstitien dicht, fein und und mehr oder weniger deutlich punktiert, flach. Prosternalapophyse schmaler. Fühler ziemlich kurz. ..... **47**

**47** Interstitien der Flügeldecken sehr dicht und fein punktiert, dadurch ziemlich matt. Punkte der Reihen der Flügeldecken etwas kleiner und etwas enger stehend. Länge/Breite der Flügeldecken 1,31–1,40. Oberseite je nach Winkel des Lichteinfalls in verschiedenen Farben reflektierend, wobei sich die Farben auf den Flügeldecken in Längsstreifen ordnen. Beine und Fühler schwarzbraun. Körperlänge 6,0–6,5 mm. – Palawan. – (Abb. 20). ..... ***A. palawanensis* n. sp.**

– Interstitien zwar dicht, aber doch nicht so dicht punktiert wie bei der vorigen Art, dadurch deutlicher als die vorige Art glänzend. Punkte der Reihen der Flügeldecken etwas größer, auf der Scheibe etwas weiter auseinander stehend. Länge/Breite der Flügeldecken 1,32–1,35, die Seiten etwas stärker als bei der vorigen Art verrundet. Je nach Winkel des Lichteinfalls glänzt die Oberseite in verschiedenen Farben. Beine und Fühler schwarz. Körperlänge 5,8–6,1 mm. – Leyte. – (Abb. 2). ..... ***A. ambitiosus* n. sp.**

**48** Breit oval. Bei den ♂♂ finden sich an den Vorderseiten der Profemora, den Hinterseiten der Mesofemora, auf der Prosternalapophyse, dem Mesosternum und auf dem Metasternum lange, dicht stehende und abstehende Haare. – Größte Breite und Höhe am Ende des ersten Drittels der Flügeldecken. Oberseite kupferfarben bis schwarzbraun, glänzend. Körperlänge 6,5–7,8 mm. – Mindanao, Große Sunda-Inseln, Malayische Halbinsel. – (Abbildungen siehe BREMER 2004a: 69–70). . . . . ***A. postdepressus*** Pic

– Nicht breit oval. ♂♂ an den genannten Stellen ohne lange abstehende Haare. . . . . **49**

**49** Halsschild und Flügeldecken mit stark farbigen Reflexionen, wobei besonders die großflächigen purpurnen bis violetten Reflexionen auf den Flügeldecken charakteristisch sind. – Länglich oval. In den etwas eingeschnittenen Striae der Flügeldecken mittelgroße, etwas längliche Punkte; Interstitien leicht gewölbt, mit feinen, nicht sehr dicht stehenden Punkten. Stirn ziemlich schmal. Fühler ziemlich lang. Metasternum der ♂♂ dicht behaart. Protarsomeren 1–3 der ♂♂ sehr leicht verbreitert. Körperlänge 4,9–6,0 mm. – Neben den Philippinen fast die gesamte orientalische Region, auch nördliche Molukken und einige Inseln des pazifischen Ozeans. – (Abbildungen siehe BREMER 2005b: 51). . . . . ***A. micans*** (Fabricius)

– Flügeldecken bei schrägem Lichteinfall ohne großflächig purpurne bis violette Reflexionen. . . . . **50**

**50** Von ähnlicher Form und Größe wie *A. micans*. Halsschild schmutzig grün. Flügeldecken blau, ohne farbige Reflexionen. Punkte in den Striae etwas größer als bei *A. micans*. ♂♂ auf dem Metasternum mit schütter stehenden, mittellangen, zarten Haaren (bei *A. micans* dicht stehend, die Oberfläche verdeckend). ♂♂ an der Innenseite der Mesotibiae ohne Ausschnitt. Körperlänge 4,4–5,5 mm. – Orchid Islands, Lan-yu of Taiwan, Luzon, Sibuyan, Negros. – (Abbildungen siehe BREMER 2004a: 62). . . ***A. cyaneipennis*** Pic

– Andere Kombination von Merkmalen. . . . . **51**

**51** Flügeldecken dunkel kupfrig, Halsschild schwarzblau (ohne farbige Reflexionen). Auf den Flügeldecken deutliche Striae, in ihnen deutliche, mittelgroße Punkte; Interstitien auf der Scheibe nicht gewölbt. Ähnelt in der Gestalt sehr *A. micans* und *A. cyaneipennis*, besitzt aber etwas kürzere Fühler. ♂♂ auf dem Metasternum ohne Haare. Innenseite der Mesotibiae der ♂♂ ohne Ausschnitt. Körperlänge 4,4–4,8 mm. – Luzon. – (Abb. 14). . . . . ***A. mendicus* n. sp.**

– Andere Kombination von Merkmalen. . . . . **52**

**52** Flügeldecken mit stärker eingeschnittenen Striae; Interstitien deutlicher gewölbt und stärker punktiert. Innenseite der Mesotibiae der ♂♂ mit einem kleinen Ausschnitt (Abb. 19A). Metasternum der ♂♂ kahl. Körperlänge 5,3 mm. – Flügeldecken (besonders im hinteren Teil) mit Farbwechsel von lateral nach medial von grün über blau nach dunkelviolett. Halsschild schwarz. Tibiae braun. Fühler hellbraun. Fühler lang, die Flügeldecken bis über die Mitte überlappend. – Luzon. – (Abb. 19). . . . . ***A. oeneus* n. sp.**

– Flügeldecken mit nur schwach eingeschnittenen Striae. ♂♂ ohne Ausschnitt an der Innenseite der Mesotibiae. Metasternum der ♂♂ behaart. Körperlänge 5,0–7,2 mm. . . . . **53**

**53** Flügeldecken oval, in den Striae schmale, kleine Punkte, die kaum auffallen; Interstitien sehr gering gewölbt. Oberseite schwarz, mit Metallschimmer. Beine schwarz, Tarsen braun, basale Antennomeren braun, apikale Antennomeren schwarz. Metasternum der ♂♂ mit langen, ungerichtet stehenden Haaren. Fühler lang, die Flügeldecken bis zur Mitte überlappend. Aedoeagus an der Spitze ohne dorsad gerichteten Widerhaken. Körperlänge 6,5–7,2 mm. – Mindanao, Leyte. – (Abb. 17). . . . . ***A. nigellus* n. sp.**

– Flügeldecken länglich oval, in den Striae mittelgroße, unregelmäßig stehende Punkte (Abstände der Punkte voneinander entsprechen dem ½- bis 3-fachen der Punktdurchmesser); Interstitien auf der Scheibe flach, seitlich sehr leicht gewölbt. Grundfarbe der Oberseite grün, je nach Winkel des Lichteinfalls in den verschiedenen Spektralfarben reflektierend. Beine und Fühler schwarz. Metasternum der ♂♂ mit zarten, sehr kurzen Haaren. Fühler mittellang, zurückgelegt nicht die Mitte der Flügeldecken erreichend. Spitze des Aedoeagus mit einem dorsad gerichteten Widerhaken. Körperlänge 5,0–5,8 mm. – Luzon, Samar, Mindanao. – (Abb. 5). . . . . ***A. boetticheri* n. sp.**

## 10 Diskussion

Amarygmini sind nachtaktive, arboreale Tenebrionidae, deren Entwicklung bei den meisten Arten unbekannt ist. Viele erscheinen nachts an Totholz, auf der Rinde von Bäumen und an Baumschwämmen. Die Mehrzahl der Arten fliegt nicht ans Licht. Man findet sie am ehesten, wenn man nachts Bäume und Totholz mit einer Lampe mit relativ hohem Blaulichtanteil absucht. Wenige *Amarygmus*-Arten, aber offensichtlich die meisten Arten der Gattung *Plesiophthalmus*, fliegen Lichtquellen an, aber auch hier sind die Ausbeuten beim Lichtfang meist gering. Offensichtlich wurde bisher auf den Inseln der Philippinen wenig mit Methoden gesammelt, mit denen man am ehesten *Amarygmus*-Arten findet. Darauf deutet hin, dass mir nur wenige Arten in größerer Zahl vorliegen. Höhere Individuenzahlen wären jedoch zu erwarten, wenn nachts gezielt nach *Amarygmus* gesucht wird. Es ist deshalb wahrscheinlich, dass die in dieser Arbeit behandelten 50 *Amarygmus*-Arten nur einen Teil der wirklich vorkommenden Arten darstellen. Es würde mich nicht wundern, wenn sich nach systematischer Sammlungsaktivität die Zahl der *Amarygmus*-Arten der Philippinen verdoppeln würde.

Abgesehen von den Arten, die eine sehr weite Verbreitung in der orientalischen Region aufweisen, wie *Amarygmus metallicus* (Perty, 1831), *A. cuprarius* ssp. *cuprarius* (Weber, 1801), *A. micans* (Fabricius, 1794), kommt eine auf den Philippinen vorkommende Art auch auf Taiwan benachbarten Inseln vor, *A. cyaneipennis* Pic, 1938. Daneben gibt es aber im Süden der Philippinen Arten, die auch auf Borneo vorkommen, zum Beispiel *A. postdepressus* Pic, 1938, oder deren Verwandte auf Borneo vorkommen, zum Beispiel *A. allectorius* Bremer, 2002, *A. boetticheri* n. sp., *A. fragilis* Bremer, 2001, *A. dissimilis* n. sp. und *A. palawanensis* n. sp.

Die meisten Arten sind offensichtlich Endemiten der philippinischen Inseln. Das trifft zum Beispiel auf alle langgestreckten Arten zu, die extrem breite Protarsomeren 1–3 besitzen, etwa *A. angustus* Gebien, 1913, *A. latipes* (Kulzer, 1951), *A. coloratus* (Kulzer, 1951), *A. elytralis* Bremer, 2001, *A. inversus* Bremer, 2005, *A. bakeri* n. sp., *A. dembickyi* n. sp., *A. mindanaensis* n. sp., *A. notabilis* n. sp., *A. platolenoides* n. sp. und *A. eremitis* n. sp. Zu

den Endemiten der philippinischen Inseln gehören auch die Arten affine *A. philippinensis* Gebien, 1944, die eine besondere Fühlerform zeigen, wie *A. langeri* n. sp., *A. rugipectus* n. sp. und *A. vulcanus* n. sp., sowie die Arten affine *A. spectabilis* Gebien, 1921, etwa *A. planipennis* (Kulzer, 1951), *A. longitarsis* Gebien, 1921, *A. trichosternum* Gebien, 1944, *A. antiquus* n. sp., *A. negrosensis* n. sp. und *A. jaegeri* n. sp. Ebenso trifft der Endemismus zu auf die Arten der Gattungen *Caudamarygmus* Bremer, 2001, *Dalmanius* Bremer, 2001 und *Luzonoplonyx* n. gen.

Einige Anmerkungen müssen auch zu der Artengruppe um *A. metallicus* (Perty, 1831) gemacht werden. Diese Art ist weitverbreitet und kommt auch auf verschiedenen Inseln der Philippinen vor. *A. metallicus* wird in der orientalischen Region und auf den Inseln der Molukken meist unter verpilztem Holz, das dem Boden aufliegt, in niedrigen Höhenlagen gefunden. Aus den Vorfahren dieser Art haben sich offensichtlich in der Cordillera Central auf Luzon und am Mt. Apo auf Mindanao in hohen Bergregionen weitere Arten entwickelt, die partiell flügellos sind, wie *A. pertyi* Bremer, 2001 (Cordillera Central) bzw. *A. pseudometallicus* n. sp. (Mt. Apo). Sogar eine Art, für die ich eine neue Gattung geschaffen hatte (mit extrem lang ausgezogenen Enden der Flügeldecken), *Caudamarygmus notabilis* Bremer, 2001, ist wahrscheinlich auf gemeinsame Vorfahren mit *A. metallicus* (Perty) zurückzuführen. Ähnliche Entwicklungen in Bergregionen anderer Gebiete der orientalischen Region sind mir nicht bekannt. Dort fehlt *A. metallicus* in höheren Lagen.

Eine ähnliche Entwicklung zu einer besonderen Form in der Höhe der Cordillera Central ist auch bei der flügellosen Gattung *Luzonoplonyx* n. gen. mit *Luzonoplonyx grandis* n. sp. zu vermuten. *Luzonoponyx grandis* besitzt eine von anderen Amarygmini abweichende Gestalt. Die Entwicklung zu flügellosen Tieren scheint bei dieser Art noch nicht sehr lange zurückzuliegen, da sich die Flügeldecken noch einzeln anheben lassen.

Offensichtlich in der Höhe der Cordillera Central haben sich auch die beiden Arten *Dalmanius peregrinus* Bremer, 2001 und *D. nanus* n. sp. entwickelt. Diese Gattung scheint älter in Bezug der Entwicklung zur Flügellosigkeit als *Luzonoplonyx* zu sein, da die beiden Flügeldecken in der Mitte zusammengewachsen sind, ähnlich wie man es bei Tentyriini und Pimeliini findet.

Eine weitere Art mit Flügellosigkeit ist *Amarygmus breviculus* Bremer, 2001 aus der Cordillera Central, aber diese Art zeigt bis auf die Flügellosigkeit die typischen Merkmale der Arten der Gattung *Amarygmus*. Flügellosigkeit kommt bei *Amarygmus*-Arten in der papuanischen Region auf den Bergen in Neu Guinea sowie auf verschiedenen Inseln der Solomonen, des Bismarck-Archipels und der Molukken häufig vor. Es erstaunt mich aber, dass ich flügellose *Amarygmus*-Arten in der orientalischen Faunenregion bisher nicht fand, obwohl es zum Beispiel auf Borneo eine Reihe von Arten gibt, die nur in höheren Lagen vorkommen, wie etwa *Amarygmus lynnae* Bremer, 2002 oder *A. communis* Bremer, 2004.

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# The genus *Laena* Latreille (Coleoptera: Tenebrionidae) in the Indian Himalayas of Uttar Anchal and Himachal Pradesh, with descriptions of four new species[1]

Wolfgang Schawaller

Abstract

This study represents a revision of the species of the genus *Laena* Latreille, 1829 (Tenebrionidae: Lagriinae) from the Indian Himalayan provinces Uttar Anchal (= mountainous part of the previous province Uttar Pradesh) and Himachal Pradesh. All available types of known species are redescribed, diagnostic characters are figured, newly collected material is listed, and four new species are described: *Laena barclayi* **n. sp.** and *Laena simlaica* **n. sp.** both from Himachal Pradesh, and *Laena badrinathica* **n. sp.** and *Laena mussoorica* **n. sp.** both from Uttar Anchal. Moreover, an identification key is provided for the 32 recognized species from both Indian provinces. The status of additional five taxa remains doubtful.

K e y w o r d s : Coleoptera, Tenebrionidae, *Laena*, Uttar Anchal, Himachal Pradesh, taxonomy, new species, distribution.

Zusammenfassung

Die Arten der Gattung *Laena* Latreille, 1829 (Tenebrionidae: Lagriinae) von den indischen Himalaya-Provinzen Uttar Anchal (= gebirgiger Teil der ehemaligen Provinz Uttar Pradesh) und Himachal Pradesh werden revidiert. Alle verfügbaren Typen der bekannten Arten werden wiederbeschrieben, diagnostische Merkmale werden abgebildet, neu gesammeltes Material wird aufgelistet und vier neue Arten werden beschrieben: *Laena barclayi* **n. sp.** und *Laena simlaica* **n. sp.**, beide von Himachal Pradesh, sowie *Laena badrinathica* **n. sp.** und *Laena mussoorica* **n. sp.**, beide von Uttar Anchal. Für alle 32 erkannten Arten dieser beiden indischen Provinzen wird ein Bestimmungsschlüssel aufgestellt, der Status fünf weiterer Taxa bleibt zweifelhaft.

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## 1 Introduction

While revising the genus *Laena* Latreille, 1829 (Tenebrionidae: Lagriinae) from the Nepal Himalayas (Schawaller 2002), species of the adjacent Indian Himalayas (Uttar Anchal, Himachal Pradesh, Darjeeling, Sikkim) have also been studied, and additional newly collected specimens have been listed in that publication. However, in that revision of the Nepalese fauna the Indian species were not redescribed and figured. This is done in the present paper for all species recorded from the northwestern Indian Himalayan provinces Uttar Anchal (since 2007 new name Uttarakhand) and Himachal Pradesh (map Fig. 1), but not for the species from the northeastern provinces Darjeeling and Sikkim. Unfortunately, five taxa from that region remain doubtful, because the corresponding types could not be studied. Not included herein are all species and records from the more western situated Kashmir, Pakistan and Afghanistan (under preparation in a forthcoming study). The numerous species from China including adjacent Tibet were treated by Schawaller (2001, 2008).

There is certain confusion about the old province name "Uttar Pradesh", which was used in old species descriptions. This province was later divided in a Himalayan part "Uttar Anchal" (where the *Laena* come from) and a lowland part "Uttar Pradesh" (where no *Laena* species occur). In 2007 "Uttar Anchal" received a new name "Uttarkhand". In this paper, the well known name "Uttar Anchal" is consequently used for that region, even if the old types are labelled with "Uttar Pradesh". Fortunately, the name of the westernmore province "Himachal Pradesh" was never changed.

In contrast to Nepal, where most of the species (63) have been collected and described only in the last 30 years, the species from Uttar Anchal and Himachal

[1] Contributions to Tenebrionidae, no. 74. – For no. 73 see: Koleopterologische Rundschau 79 (2009).

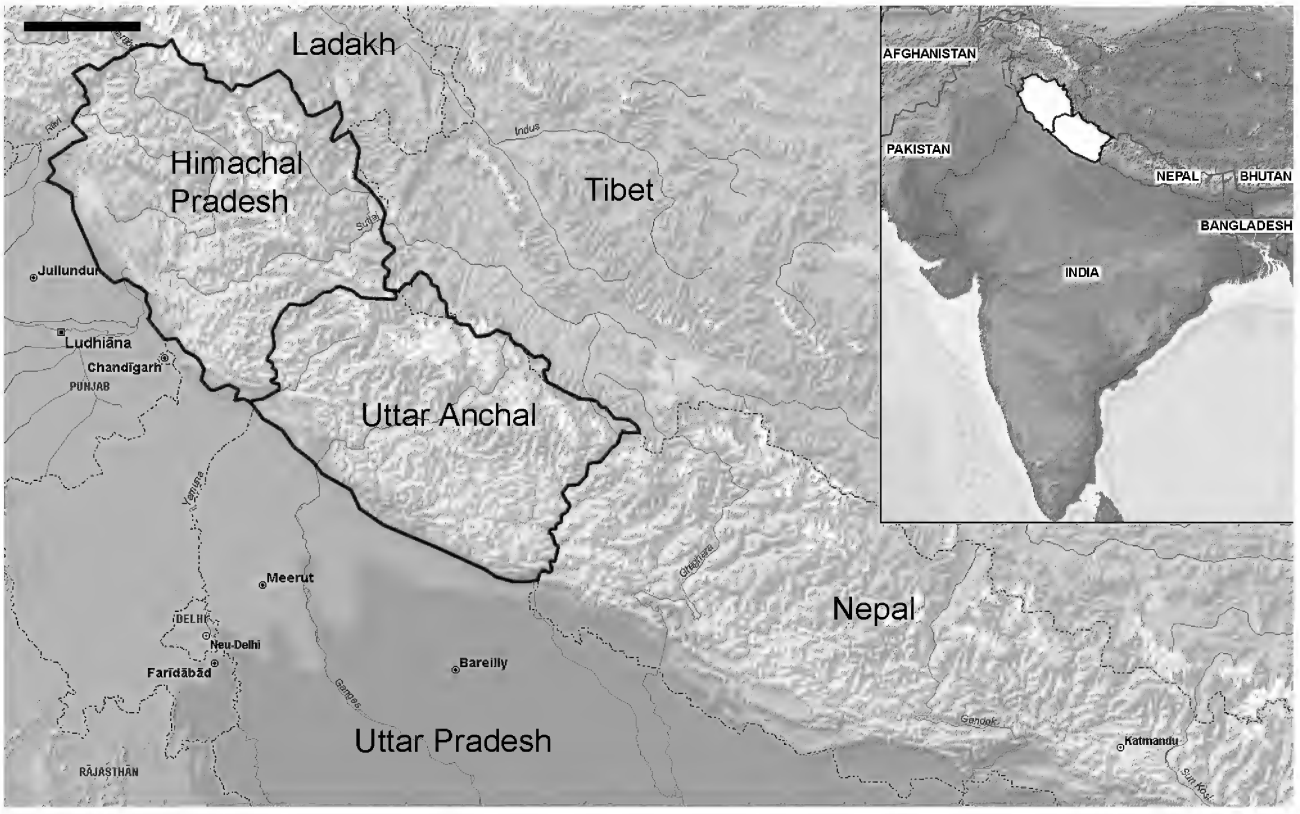



**Fig. 1.** The investigated area with records of *Laena* spp. in the Indian Himalayan provinces Uttar Anchal (since 2007 new name Uttarakhand) and Himachal Pradesh. – Scale line: 100 km.

Pradesh (now 32 and 5 doubtful taxa) have been mostly described already in previous decades (SCHUSTER 1916, 1926, 1935). The different periods of descriptions reflect the different periods of access for fieldwork. This paper adds "only" four new species, however one with quite remarkably modified male tibiae. The species of *Laena* are wingless and most species populate only small areas in a restricted altitudinal belt. Not a single species from Nepal and Tibet occurs also in the adjacent Indian provinces Uttar Anchal and Himachal Pradesh.

Acronyms of depositories

| | |
|---|---|
| BMNH | The Natural History Museum, London, United Kingdom (MAX BARCLAY) |
| CRGT | Private collection Dr. ROLAND GRIMM, Tübingen, Germany |
| CRSW | Private collection RUDOLF SCHUH, Vienna, Austria |
| HNHM | Hungarian Natural History Museum, Budapest, Hungary (Dr. OTTÓ MERKL) |
| SMNS | Staatliches Museum für Naturkunde, Stuttgart, Germany |

Acknowledgements

Without the trustful loan of types by MAX BARCLAY (London) and Dr. OTTÓ MERKL (Budapest) my studies about the Himalayan *Laena* would have remained fragmentary. I wish to thank them also for their kind hospitality during my visits for comparative studies. Dr. ALEXANDER RIEDEL (Karlsruhe) generously deposited the collected tenebrionids of his first travels in the Museum Stuttgart. JOHANNES REIBNITZ (Stuttgart) scanned my drawings and combined them on plates. Dr. ROLAND GRIMM (Tübingen) and Dr. OTTÓ MERKL improved the manuscript by their comments as referees.

## 2 The species of *Laena* in Uttar Anchal and Himachal Pradesh

### *Laena almorensis* Schuster, 1926 (Figs. 2–4)

Studied type material: India, Uttar Anchal, W Almora Division, Sunderdhunga Valley, 8000–12000 ft. (2450–3660 m), VI.1919, leg. H. G. CHAMPION, 3 syntypes BMNH, 1 ♂ syntype designated as lectotype by SCHAWALLER (2002).

Redescription: Body length 3.8–4.2 mm. Eyes not prominent. Pronotum (Fig. 2) with small punctures, distance as 2–6 diameters, all punctures with long erect setae; surface flat and shining; lateral margin unbordered; propleura with similar punctation and same setation as on disc. Elytra (Fig. 2) with rows of punctures without striae, punctures of rows as large as punctures on pronotum,

most punctures with a short adpressed seta; intervals with an irregular row of small punctures bearing each a seta of same length; all intervals flat and shining. All femora without teeth or angulations (Fig. 3). All tibiae without distinct sexual dimorphism. Apicale of aedeagus see Fig. 4.

Distribution: India (Uttar Anchal).

### *Laena badrinathica* **n. sp.**
(Figs. 5–7)

Holotype (♂): India, Uttar Anchal, Chamoli Distr., Badrinath, 3200–3600 m, 1.VIII.1989, leg. A. Riedel, SMNS.

Paratype: India, Uttar Anchal, Chamoli Distr., Joshimath, Ghangaria, 2700 m, 4.VIII.1989, leg. A. Riedel, 1 ex. SMNS.

Etymology: Named after the village Badrinath, in whose vicinity the holotype has been collected.

Description: Body length 5.0–5.5 mm. Eyes not prominent. Pronotum (Fig. 5) with larger punctures, distance as 1–4 diameters, all punctures with longer erect setae; surface flat and shining; lateral margin bordered; propleura with sparser punctation and shorter setation than on disc. Elytra (Fig. 5) with rows of punctures without striae, punctures of rows as large as punctures on pronotum, most punctures with long seta; intervals with an irregular row of small punctures bearing each a longer erect seta, interval 9 with 4 indistinct setiferous pores; all intervals flat and shining. Anterior femur with a small sharp angulation (Fig. 6), middle and posterior femora with a pair of similar sharp angulations. All tibiae without peculiarities. Apicale of aedeagus see Fig. 7.

Diagnosis: *Laena badrinathica* n. sp. is characterized by the small body size, the bordered lateral margin of the pronotum, the shining dorsal surface with long setation, the elytral punctural rows without striae, the armed femora without teeth but with distinct angulations, and the shape of the aedeagus. *L. bhatiai* and *L. gardneri* possess similarly armed femora and also bordered lateral margins of the pronotum, but both species are larger (around 7 mm) and have a shagreened dull dorsal surface with shorter dorsal setation. Additionally in *L. gardneri* the elytral punctural rows are in feeble striae and the elytral intervals are convex.

### *Laena barclayi* **n. sp.**
(Figs. 8–10)

Holotype (♂): India, Himachal Pradesh, Jalori Pass, Seraj, 10800 ft. (3300 m), without date, leg. H. G. Champion, BMNH.

Etymology: Named in honour of Max Barclay (The Natural History Museum, London) for fruitful cooperation.

Description: Body length 7.3 mm. Eyes not prominent. Pronotum (Fig. 8) with larger punctures, distance as 0.5–4.0 diameters, most punctures with short adpressed setae; surface flat and shining; lateral margin unbordered; propleura with similar punctation and setation as on disc. Elytra (Fig. 8) with rows of punctures without striae, punctures of rows somewhat larger than punctures on pronotum, most punctures with short adpressed seta; intervals without punctation and setation, interval 9 without distinct setiferous pores; all intervals convex and shining. All femora without teeth or angulations. Anterior tibiae of males with a striking finger-like interior process (Fig. 9), middle and posterior tibiae without peculiarities. Apicale of aedeagus see Fig. 10.

Diagnosis: To be recognized by the longitudinal pronotum with unbordered lateral margin, unarmed femora, the shape of the aedeagus and particularly the male anterior tibia with a finger-like interior process. Such a structure of the male tibia (most probably a form of sexual dimorphism) does not occur in any of the numerous Himalayan species, but only in a single species from Sichuan, *Laena schusteri* (Heller, 1923). This species has a broader pronotum, broader elytra with the elytral punctural rows in striae and a completely different shape of the apicale of aedeagus (illustrated by Schawaller 2001: figs. 188–191).

### *Laena beesoni* Schuster, 1935
(Figs. 11–13)

Studied type material: India, Punjab, Simla, Kotkhai, Kalala F. (?Forest), 8000 ft. (2450 m), 14.–15.V.1924, leg. C. F. C. Beeson, 2 syntypes BMNH, 1 ♂ designated as lectotype by Schawaller (2002).

Redescription: Body length 3.4–4.3 mm. Eyes prominent. Pronotum (Fig. 11) with large punctures, distance as 1–3 diameters, all punctures with short adpressed setae; surface flat and shining; lateral margin distinctly bordered; propleura with sparser punctation than on disc and without setation. Elytra (Fig. 11) with rows of punctures without striae, punctures of rows very deep and larger than punctures on pronotum, most punctures without or some with a very short seta; intervals without punctures and setation; all intervals convex and shining. All femora without teeth or angulations (Fig. 12). All tibiae without distinct sexual dimorphism. Apicale of aedeagus see Fig. 13.

Distribution: India (Himachal Pradesh).

### *Laena bhatiai* Schuster, 1935
(Figs. 14–15)

Studied type material: India, Uttar Anchal, Deh-

ra Dun, 16.VI.1926, leg. F. Z., holotype BMNH (sex not examined).

Redescription: Body length 7.0 mm. Eyes not prominent. Pronotum (Fig. 14) with larger punctures, distance as 2–5 diameters, most punctures particularly laterally with longer erect setae; surface flat and shagreened; lateral margin bordered; propleura with sparser punctation than and similar setation as on disc. Elytra (Fig. 14) with rows of punctures without striae, punctures of rows as large as punctures on pronotum, most punctures without seta; intervals with an irregular row of small punctures bearing each a longer erect seta, particularly laterally, interval 9 with 4 setiferous pores; all intervals flat and shagreened. Anterior femur with a pair of small sharp angulations (Fig. 15), middle femur with a pair of larger sharp angulations, posterior femur with a small angulation and one tooth. Sexual dimorphism of tibiae unknown. Apicale of aedeagus unknown.

Distribution: India (Uttar Anchal).

## *Laena blairi* Schuster, 1926
(Figs. 18–20)

Studied type material: India, Uttar Anchal, Chakrata Distr., Kanasar, 7050 ft. (2150 m), 14.–22.V.1922, leg. S. N. Chatterjee, 1 ♂ syntype BMNH, designated as lectotype by Schawaller (2002). – India, Deoban (?Deohan), Gaunsar, 8500 ft. (2600 m), 24.V.1915, leg. C. F. C. Beeson, 1 ♀ syntype BMNH. – Without locality label, 1 syntype BMNH.

Redescription: Body length 5.0–5.5 mm. Eyes not prominent. Pronotum (Fig. 18) with large punctures, distance as 1–3 diameters, all punctures with long erect setae; surface flat and shining; lateral margin unbordered; propleura with similar punctation and same setation as on disc. Elytra (Fig. 18) on disc with rows of punctures without striae, lateral rows 3–8 irregular, punctures of rows as large as punctures on pronotum, all punctures with a long and erect seta; intervals with an irregular row of small punctures bearing each a seta of same length, punctures in lateral intervals as large as punctures of the rows; all intervals flat and shining. All femora in both sexes without teeth or angulations. Anterior tibiae of males with a feeble interior dilatation (Fig. 19), middle and posterior tibiae without sexual dimorphism. Apicale of aedeagus see Fig. 20.

Distribution: India (Uttar Anchal).

## *Laena cameroni* Schuster, 1926
(Figs. 21–22)

Studied type material: India, Uttar Anchal, Mussoorie, Ringal Gad, 15.IV.1922, leg. M. Cameron, 1 ♀ syntype BMNH, designated as lectotype by Schawaller (2002).

Redescription: Body length 6.5 mm. Eyes not prominent. Pronotum (Fig. 21) with large punctures, distance as 1–4 diameters, all punctures with long erect setae; surface flat and shining; lateral margin distinctly bordered; propleura with similar punctation and same setation as on disc. Elytra (Fig. 21) with rows of punctures without striae, punctures of rows as large as punctures on pronotum, most punctures with a short seta; intervals with an irregular row of small punctures bearing each a seta of same length; all intervals slightly convex and shining. All femora without teeth or angulations (Fig. 22). Sexual dimorphism of tibiae unknown. Apicale of aedeagus unknown.

Distribution: India (Uttar Anchal).

## *Laena carinata* Schuster, 1926
(Figs. 16–17)

Studied type material: India, Uttar Anchal, Chakrata Distr., Konain, 24.–30.V.1922, leg. S. N. Chatterjee, 8000 ft. (2450 m), 1 syntype BMNH, designated as lectotype by Schawaller (2002) (sex not examined).

Redescription: Body length 11.0 mm. Eyes not prominent. Head with distinct ocular keel. Pronotum (Fig. 16) with large and confluent punctures, distance as 0.5–1.0 diameters, most punctures with short adpressed setae; surface somewhat uneven by the confluent punctures and shagreened; lateral margin bordered; propleura with similar punctation and same setation as on disc. Elytra (Fig. 16) with rows of punctures without striae, punctures of rows somewhat larger than punctures on pronotum, most punctures with a short adpressed seta; intervals nearly without punctures and setae; inner intervals flat, intervals 5, 7 and 9 distinctly convex, particularly posteriorly, shagreened. All femora without teeth or angulations (Fig. 17). Sexual dimorphism of tibiae unknown. Aedeagus unknown.

Remarks: *Laena carinata* Schuster, 1926 and *Laena indica* Fairmaire, 1896 are quite similar in body size and proportions, and share elevated elytral intervals 3, 5 and 7, but *L. carinata* has a dense and confluent pronotal punctation (sparser in *L. indica*), short adpressed setae on the elytra (naked in *L. indica*) and particularly oval and not prominent eyes with a distinct ocular keel (round and prominent and without ocular keel in *L. indica*). *L. grandis* Schuster, 1935 might belong to the same group but has the lateral margin of the pronotum unbordered and the punctures in the elytral rows small and in striae. The aedeagi cannot be compared, because the holotype of *L. grandis* is a female, and the sex of the lectotype of *L. carinata* has not been examined in these few old and fragile specimens.

Distribution: India (Uttar Anchal).

*Laena carinipennis* Schuster, 1935
(Figs. 23–24)

Studied type material: India, Kulu, 1.–10.VI.1933, leg. R. N. PARKER, ♀ holotype BMNH.

Redescription: Body length 7.5 mm. Eyes slightly prominent. Pronotum (Fig. 23) with large punctures, distance as 1–3 diameters, most punctures with short adpressed setae; surface flat and shagreened; lateral margin finely bordered; propleura with similar punctation and same setation as on disc. Elytra (Fig. 23) with rows of punctures with feeble striae, punctures of rows as large as punctures on pronotum, punctures without or with a few very short setae; intervals with scattered distinct punctures bearing each a short adpressed seta of same length, interval 9 with 1 setiferous pore; inner intervals slightly convex, intervals 3, 5 and 7 broader and distinctly convex, particularly posteriorly, shagreened. All femora with a pair of acute corners (Fig. 24). Sexual dimorphism of tibiae unknown. Aedeagus unknown.

Distribution: India (Himachal Pradesh).

*Laena championi* Schuster, 1926
(Figs. 25–26)

Studied type material: India, Uttar Anchal, W Almora Division, Kumaon, VI.1919, leg. H. G. CHAMPION, holotype BMNH (sex not examined).

Redescription: Body length 8.0 mm. Eyes slightly prominent. Pronotum (Fig. 25) with large punctures, distance as 1–5 diameters, most punctures with longer adpressed setae; surface flat and shining; lateral margin distinctly bordered; propleura with sparser punctation and shorter setation than on disc. Elytra (Fig. 25) with rows of punctures with striae, punctures of rows as large as punctures on pronotum, most punctures with a short seta; inner intervals with a few very large punctures (broken setae?), lateral intervals with a few longer erect setae; all intervals flat and shining. All femora with distinct teeth (Fig. 26). Sexual dimorphism of tibiae unknown. Aedeagus unknown.

Distribution: India (Uttar Anchal).

*Laena chatterjeei* Schuster, 1935
(Figs. 27–28)

Studied type material: India, Himachal Pradesh, Simla, Matiana, 7900 ft. (2400 m), 30.IX.1921, leg. S. N. CHATTERJEE, holotype BMNH (sex not examined).

Redescription: Body length 4.8 mm. Eyes not prominent. Pronotum (Fig. 27) with small punctures, distance as 0.5–3.0 diameters, most punctures with short adpressed setae; surface flat and shagreened; lateral margin bordered; propleura with similar punctation as and shorter setation than on disc. Elytra (Fig. 27) with rows of punctures without striae, punctures of rows larger than punctures on pronotum, punctures without seta; intervals without punctures and setae; all intervals slightly convex and shining. All femora without teeth or angulations (Fig. 28). Sexual dimorphism of tibiae unknown. Aedeagus unknown.

Distribution: India (Himachal Pradesh).

*Laena clypealis* Fairmaire, 1896

Studied type material: None.

Remarks: The original description is too poor and the type could not be reexamined, thus this taxon remains unclear. According to the description *L. minuta* is similar, but in *L. clypealis* the pronotum is rounder, the elytral striae are deeper and the elytral intervals are convex (flat in *L. minuta*). Body length 4.0 mm. Type locality Simla.

Distribution: Pakistan (Murree), India (Himachal Pradesh).

*Laena convexicollis* Reitter, 1908
(Figs. 29–31)

Studied type material: India, Kulu, leg. ROST, ♂ holotype HNHM (both antennae and right anterior leg missing).

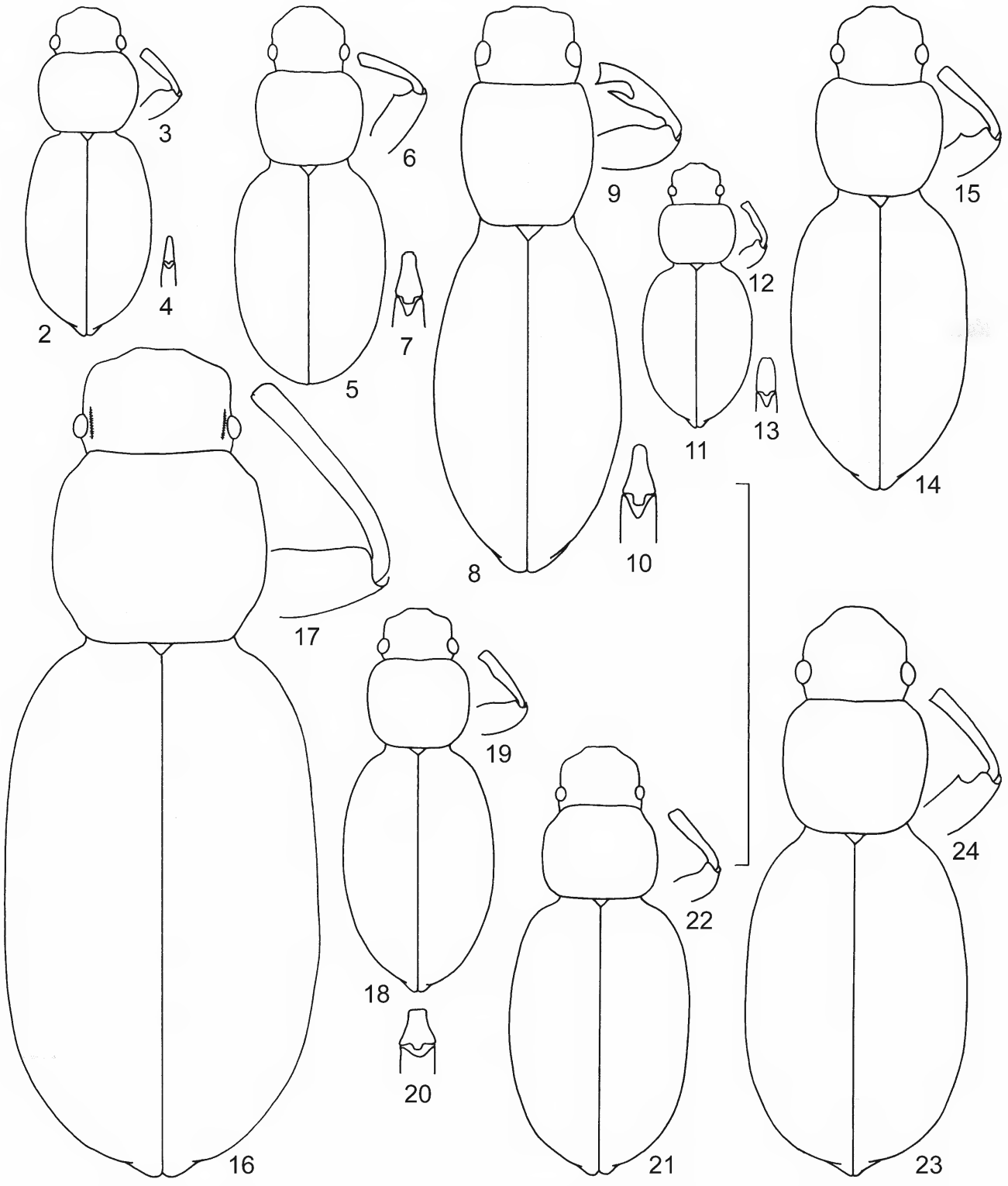
Redescription: Body length 7.0 mm. Eyes not prominent. Pronotum (Fig. 29) with large punctures, distance as 1–3 diameters, most punctures with short adpressed setae; surface with a pair of feeble impressions and shining; lateral margin marked but unbordered; propleura with larger punctation than on disc and without setation. Elytra (Fig. 29) with rows of punctures without striae, punctures of rows similar as punctures on pronotum, most punctures with small adpressed seta; intervals with an irregular row of small punctures bearing each a seta of same length, interval 9 basally with 1 distinct and posteriorly with 3 indistinct setiferous pores; all intervals flat and shining. All femora without teeth or angulations (Fig. 30). All tibiae without distinct sexual dimorphism. Apicale of aedeagus see Fig. 31.

Distribution: India (Himachal Pradesh).

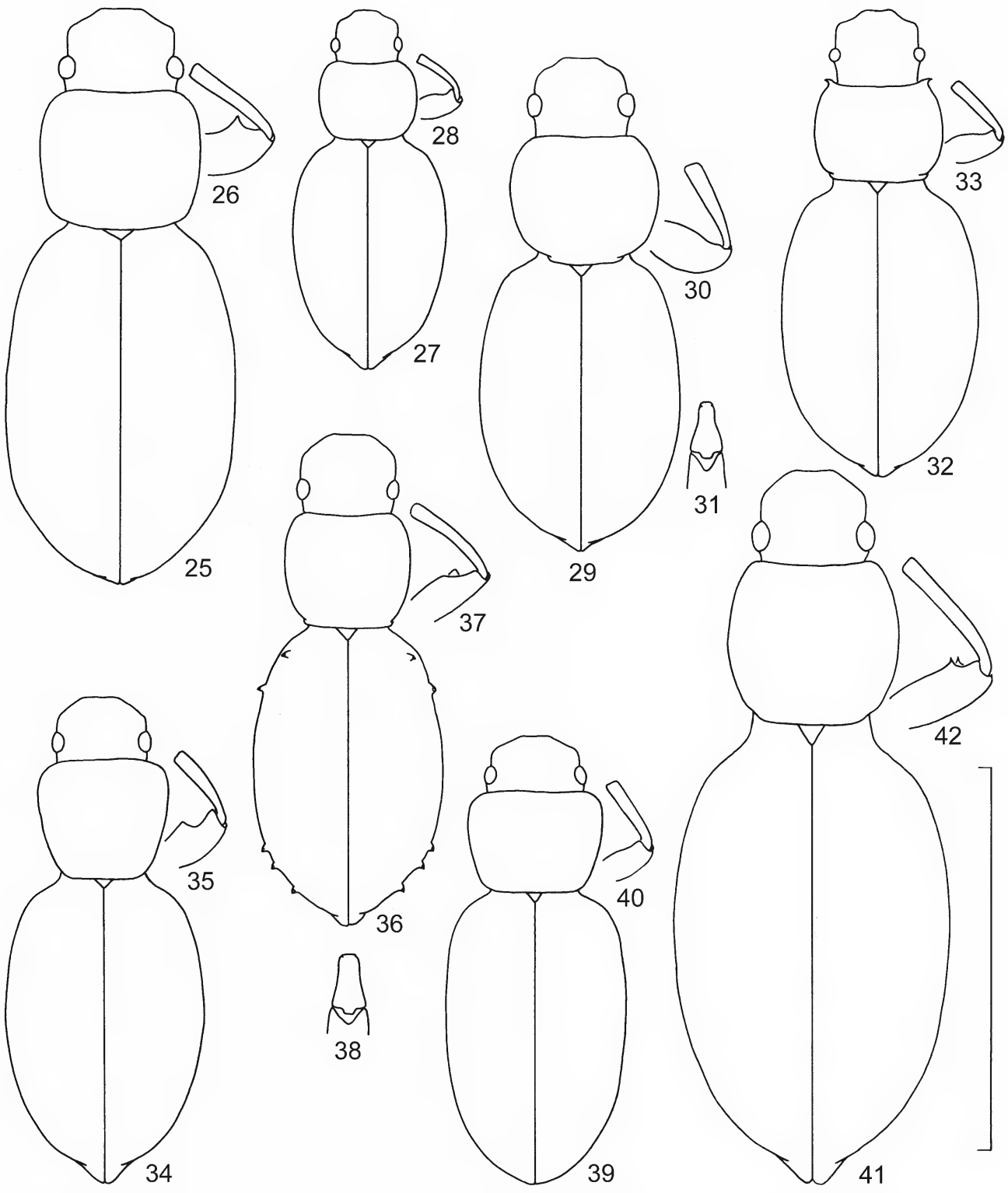
*Laena denticollis* Schuster, 1926
(Figs. 32–33)

Studied type material: India, Uttar Anchal, Kumaon, W Almora, leg. H. G. CHAMPION, 1 ♀ syntype BMNH, designated as lectotype by SCHAWALLER (2002).

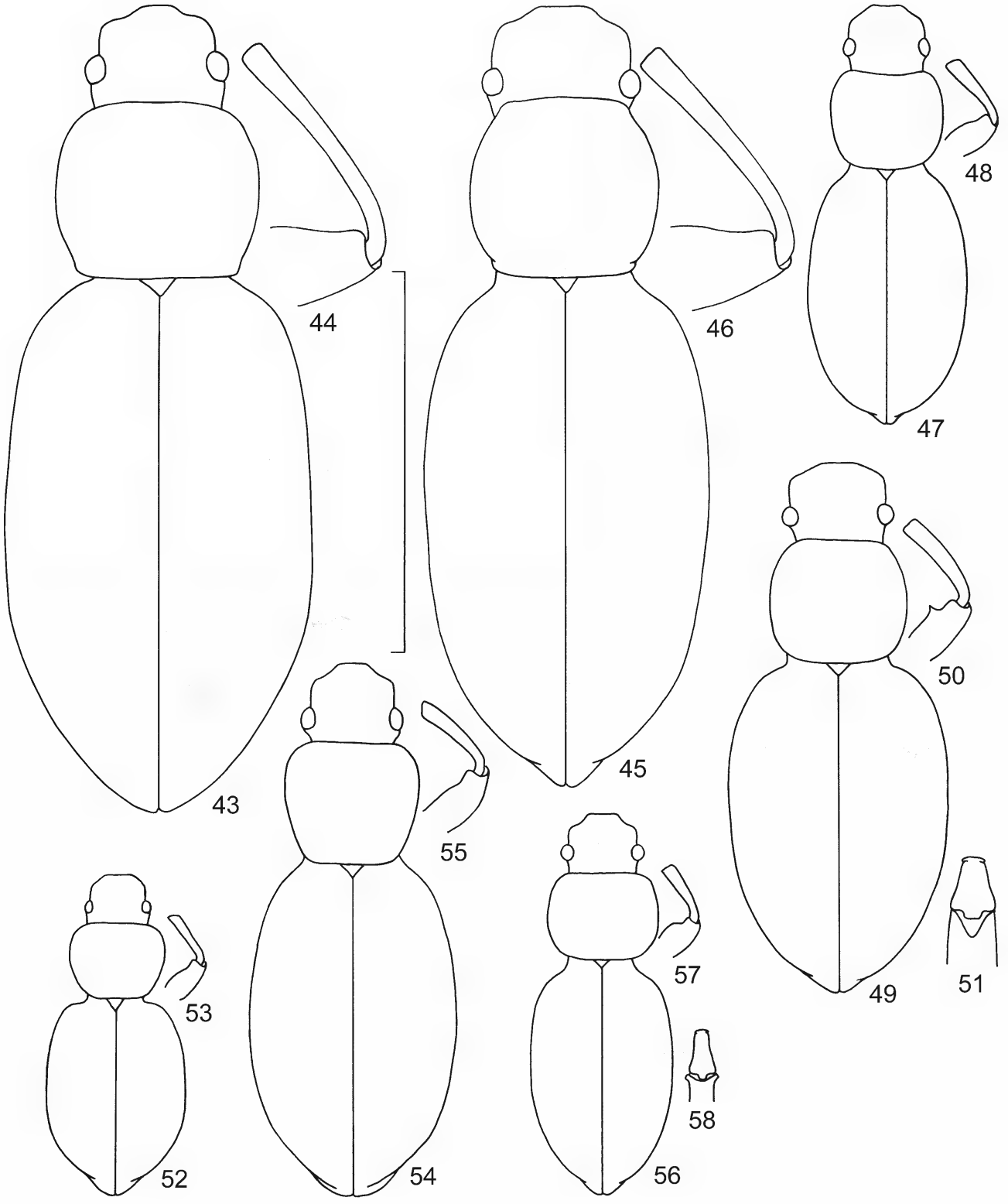
Redescription: Body length 6.0 mm. Eyes slight-



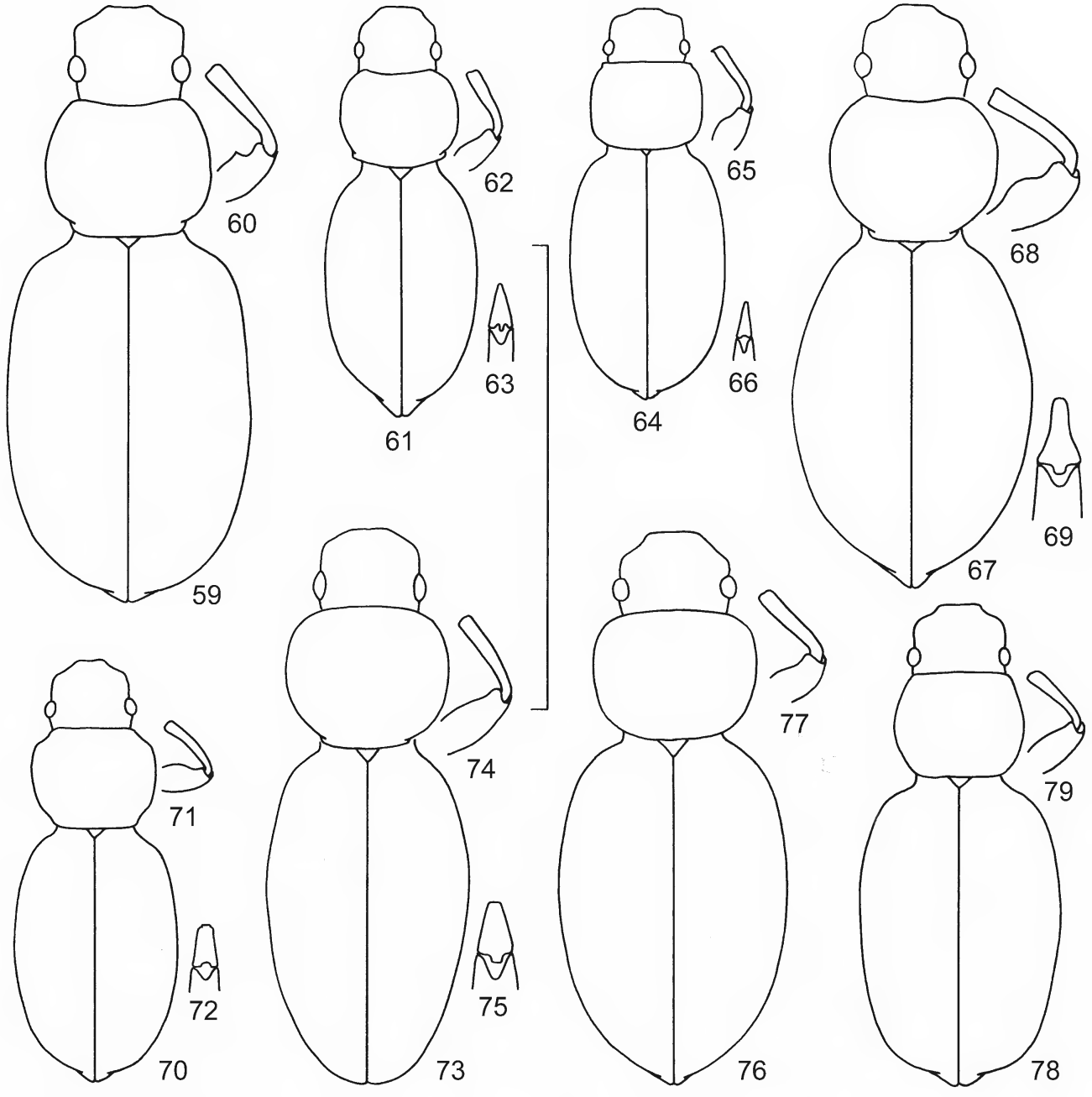

**Figs. 2–24.** *Laena* spp., body shape, anterior femur and tibia, apicale of aedeagus. – **2–4**. *L. almorensis*, ♂ lectotype. **5–7**. *L. badrinathica* n. sp., ♂ holotype. **8–10**. *L. barclayi* n. sp., ♂ holotype. **11–13**. *L. beesoni*, ♂ lectotype. **14–15**. *L. bhatiai*, holotype, sex not examined. **16–17**. *L. carinata*, lectotype, sex not examined. **18–20**. *L. blairi*, ♂ lectotype. **21–22**. *L. cameroni*, ♀ lectotype. **23–24**. *L. carinipennis*, ♀ holotype. – Scale line: 5.0 mm (body, legs), 2.5 mm (aedeagus).




**Figs. 25–42.** *Laena* spp., body shape, anterior femur and tibia, apicale of aedeagus. – **25–26**. *L. championi*, holotype, sex not examined. **27–28**. *L. chatterjeei*, holotype, sex not examined. **29–31**. *L. convexicollis*, ♂ holotype. **32–33**. *L. denticollis*, ♀ lectotype. **34–35**. *L. gardneri*, ♀ lectotype. **36–38**. *L. denticrus*, ♂ non-type. **39–40**. *L. irregularis*, ♀ holotype. **41–42**. *L. gebieni*, ♀ paratype. – Scale line: 5.0 mm (body, legs), 2.5 mm (aedeagus).




**Figs. 43–58.** *Laena* spp., body shape, anterior femur and tibia, apicale of aedeagus. – **43–44**. *L. grandis*, ♀ holotype. **45–46**. *L. indica*, non-type, sex not examined. **47–48**. *L. kaliensis*, holotype, sex not examined. **49–51**. *L. kuluana*, ♂ holotype. **52–53**. *L. minuta*, ♀ non-type. **54–55**. *L. mussoorica* n. sp., ♀ holotype. **56–58**. *L. orbicollis*, ♂ lectotype. – Scale line: 5.0 mm (body, legs), 2.5 mm (aedeagus).




**Figs. 59–79.** *Laena* spp., body shape, anterior femur and tibia, apicale of aedeagus. – **59–60**. *L. parkeri*, holotype, sex not examined. **61–63**. *L. puncticollis*, ♂ holotype. **64–66**. *L. punctatissima*, ♂ holotype. **67–69**. *L. rosti*, ♂ holotype. **70–72**. *L. similis*, ♂ holotype. **73–75**. *L. simlaica* n. sp., ♂ holotype. **76–77**. *L. tibialis*, ♀ holotype. **78–79**. *L. villosa*, ♀ holotype. – Scale line: 5.0 mm (body, legs), 2.5 mm (aedeagus).

ly prominent. Pronotum (Fig. 32) with large punctures, distance as 1–3 diameters, most punctures with adpressed setae; surface somewhat uneven and shining; lateral margin bordered; propleura with sparser punctation than and similar setation as on disc. Elytra (Fig. 32) with rows of punctures without striae, punctures of rows larger than punctures on pronotum, most punctures with a very short seta; intervals with an irregular row of very small punctures bearing each a very short seta, interval 9 with 3 setiferous pores; all intervals convex and shining. All femora without teeth or angulations (Fig. 33). Sexual dimorphism of tibiae unknown. Aedeagus unknown.

Distribution: India (Kashmir, Uttar Anchal).

### *Laena denticrus* Fairmaire, 1896
(Figs. 36–38)

*Laena dentipennis* Reitter, 1908 (syn.).

Studied type material: India, Simla, ♀ holotype of *L. dentipennis* HNHM.

Redescription: Body length 6.8–8.5 mm. Eyes not prominent. Pronotum (Fig. 36) with large and partly confluent punctures, distance as 0.5–1.0 diameters, most punctures with longer adpressed setae; surface flat and shagreened; lateral margin unbordered; propleura with sparser punctation than and similar setation as on disc. Elytra (Fig. 36) with rows of punctures without striae, punctures of rows as large as punctures on pronotum, most punctures with a microseta; intervals with irregular fine puncation, punctures with distinct adpressed setae, intervals 7 and 9 each basally with 1 and interval 9 distally with 3 distinct tooth-like setiferous pores); alternate intervals 5 and 7 distinctly convex, remaining intervals flat, all intervals shagreened. Anterior femur with a distinct tooth and with a weak opposite angulation (Fig. 37), middle and posterior femora with a distinct tooth. All tibiae without distinct sexual dimorphism. Apicale of aedeagus see Fig. 38.

Remarks: The redescription is based also on ♂ nontype specimens from Simla in the SMNS.

Distribution: India (Himachal Pradesh).

### *Laena gardneri* Schuster, 1935
(Figs. 34–35)

Studied type material: India, Uttar Anchal, Chakrata, Mundali, 29.V.1934, leg. J. C. M. Gardner, 1 ♀ syntype BMNH, designated as lectotype by Schawaller (2002). – India, Uttar Anchal, Chakatra, Mundali, 14.IV.1933, leg. J. C. M. Gardner, 1 ♀ syntype BMNH.

Redescription: Body length 6.7–7.3 mm. Eyes not prominent. Pronotum (Fig. 34) with small punctures, distance as 2–5 diameters, most punctures with longer adpressed setae; surface flat and shagreened; lateral margin bordered; propleura with sparser punctation than on disc and without setation. Elytra (Fig. 34) with rows of punctures with feeble striae, punctures of rows as large as punctures on pronotum, punctures without seta; intervals with a few small punctures, longer erect setae only in the humeral region; all intervals convex and shagreened. Anterior and middle femora each with two distinct edges (Fig. 35), posterior femur with a broad tooth and an additional distinct edge. Sexual dimorphism of tibiae unknown. Aedeagus unknown.

Distribution: India (Uttar Anchal).

### *Laena gebieni* Reitter, 1906
(Figs. 41–42)

Studied type material: India, Kashmir, leg. Rost, 1 ♀ paratype HNHM.

Redescription: Body length 10.0 mm. Eyes not prominent. Pronotum (Fig. 41) with large punctures, distance as 1–3 diameters, some punctures particularly laterally with very short adpressed setae; surface flat and shagreened; lateral margin unbordered; propleura with distinctly sparser punctation than and with similar short setation as on disc. Elytra (Fig. 41) with rows of punctures without striae, punctures of rows distinctly smaller than punctures on pronotum, punctures without setation; intervals without punctation and without setation; all intervals flat (only interval 7 slightly convex) and distinctly shagreened. All femora with two opposite distinct teeth of similar size (Fig. 42). Sexual dimorphism of tibiae unknown. Aedeagus unknown.

Distribution: India (Kashmir, Himachal Pradesh).

### *Laena grandis* Schuster, 1935
(Figs. 43–44)

Studied type material: India, Uttar Anchal, Kali Valley, Almora, 8000 ft. (2450 m), 8.VII.1923, leg. R. N. Parker, ♀ holotype BMNH.

Redescription: Body length 11.3 mm. Eyes not prominent. Pronotum (Fig. 43) with large punctures, distance as 0.5–4.0 diameters, some punctures with very short setae; surface somewhat uneven and shagreened; lateral margin unbordered; propleura with similar punctation as on disc and without setation. Elytra (Fig. 43) with rows of punctures with striae, punctures of rows as large as punctures on pronotum, most punctures with a very short seta; intervals with an irregular row of large punctures without setation; all intervals flat and shagreened. All femora without teeth or angulations (Fig. 44). Sexual dimorphism of tibiae unknown. Aedeagus unknown.

Remarks: See under *L. carinata* Schuster, 1926.
Distribution: India (Uttar Anchal).

### *Laena himalayana* Schuster, 1915

Studied type material: None.

Remarks: According to the description, the type should be deposited in the BMNH, but it cannot be found there. Thus, the status of this species can be judged by the description only.

Distribution: India (Himachal Pradesh).

### *Laena indica* Fairmaire, 1896
(Figs. 45–46)

Studied type material: India, Simla, without further data, 1 syntype HNHM (without head, thorax and anterior pair of legs, therefore not designated as lectotype, sex not examined).

Redescription: Body length 11.5 mm. Eyes slightly prominent. Pronotum (Fig. 45) with large punctures, distance as 1–4 diameters, some punctures with short adpressed setae; surface flat and shagreened; lateral margin bordered; propleura with similar punctation and same setation as on disc. Elytra (Fig. 45) with rows of punctures without striae, punctures of rows as large as punctures on pronotum and without setation; inner intervals flat, intervals 5, 7 and 9 distinctly convex, particularly posteriorly, shagreened. All femora without teeth or angulations (Fig. 46). Sexual dimorphism of tibiae unknown. Aedeagus unknown.

Remarks: The redescription is based on a non-type specimen from Simla in the HNHM, which was compared with the type by the late Dr. KASZAB. See under *L. carinata* Schuster, 1926.

Distribution: India (Himachal Pradesh).

### *Laena irregularis* Schuster, 1935
(Figs. 39–40)

Studied type material: India, Uttar Anchal, Chakrata Distr., Bodyar, 8300 ft. (2550 m), 3.–12.V.1922, leg. S. N. CHATTERJEE, ♀ holotype BMNH.

Redescription: Body length 5.5 mm. Eyes not prominent. Pronotum (Fig. 39) with large punctures, distance as 0.5–1.0 diameters, most punctures with long erect setae; surface flat and shagreened; lateral margin unbordered; propleura with similar punctation and same setation as on disc. Elytra (Fig. 39) with rows of punctures without striae and intervals with same punctures, so elytra with irregular punctation, punctures of rows somewhat larger than punctures on pronotum, most punctures with a long erect seta; all intervals flat and shagreened. All femora without teeth or angulations (Fig. 40). Sexual dimorphism of tibiae unknown. Aedeagus unknown.

Distribution: India (Uttar Anchal).

### *Laena kaliensis* Schuster, 1935
(Figs. 47–48)

Studied type material: India, Uttar Anchal, Kali Valley, Almora, 10500 ft. (3200 m), 15.VII.1923, leg. R. N. PARKER, holotype BMNH (sex not examined).

Redescription: Body length 6.0 mm. Eyes not prominent. Pronotum (Fig. 47) with small punctures, distance as 1–3 diameters, most punctures with short adpressed setae; surface flat and shining; lateral margin bordered; propleura with similar punctation and setation as on disc. Elytra (Fig. 47) with rows of punctures without striae, punctures of rows somewhat larger than punctures on pronotum, most punctures with a short adpressed seta; intervals with an irregular row of small but distinct punctures bearing each a seta of same length; all intervals flat and shining. Anterior femur without (Fig. 48), middle and posterior femora with an indistinct tooth. Sexual dimorphism of tibiae unknown. Aedeagus unknown.

Distribution: India (Uttar Anchal).

### *Laena kuluana* Reitter, 1908
(Figs. 49–51)

Studied type material: India, Himachal Pradesh, Kulu, ♂ holotype HNHM.

New material: India, Himachal Pradesh, Kulu Valley, Manali, 1900–2100 m, V.1989, leg. R. SCHUH, 3 ex. CRSW, 1 ex. SMNS. – India, Kulu, Parbatti Valley, 6000–8000 ft. (1850–2450 m), leg. H. G. CHAMPION, 1 ex. BMNH. – India, Kulu, Seraj, Jalori Pass, 10800 ft. (3300 m), leg. H. G. CHAMPION, 2 ex. BMNH.

Redescription: Body length 7.0–8.0 mm. Eyes slightly prominent. Pronotum (Fig. 49) with large punctures, distance as 1–3 diameters, some punctures particularly laterally with very short adpressed setae; surface with a pair of feeble impressions and shagreened; lateral margin bordered; propleura with sparser punctation than on disc and without setation. Elytra (Fig. 49) with rows of punctures in feeble striae, punctures of rows distinctly larger than punctures on pronotum, punctures without setation; intervals with scattered fine punctation and without setation; all intervals slightly convex and shagreened. All femora with distinct teeth and with an opposite smaller angulation (Fig. 50). Tibiae without distinct sexual dimorphism. Apicale of aedeagus see Fig. 51.

Distribution: Pakistan (Murree, Rawalpindi), India (Kashmir, Himachal Pradesh).

### *Laena lacordairei* Marseul, 1876

Studied type material: None.

Remarks: The original description is incomplete, no differential diagnosis was given and the type (in the Museum Paris) could not be reexamined. Therefore the status of this taxon remains uncertain at present. Body length 11 mm. Type locality "Landour", a village near Mussoorie.

Distribution: Northern India (Uttar Anchal).

### *Laena laevigata* Schuster, 1926

Studied type material: None.

Remarks: The type series is deposited in Dehra Dun (India) and could not be reexamined. This species is said to be related with *L. jalaorana* Reitter, 1908 from Punjab and *L. kuluana* Reitter, 1908 from Kulu. According to the description (Schuster 1926) *L. laevigata* is smaller (body length 7.5–9 mm) than *L. jalaorana* (9.0–10.5 mm), has larger punctures in the elytral striae, the anterior femora without any teeth and the middle and posterior femora with smaller teeth. *L. kuluana* (7.0–8.0 mm) has a finer pronotal punctation and distinct teeth on all femora.

Distribution: India (Uttar Anchal).

### *Laena minuta* Fairmaire, 1896
(Figs. 52–53)

Studied type material: None.

Redescription: Body length 4.0 mm. Eyes not prominent. Pronotum (Fig. 52) with large punctures, distance as 1–3 diameters, all punctures with short adpressed setae; surface flat and shining; lateral margin distinctly bordered; propleura with sparser punctation than on disc and without setation. Elytra (Fig. 52) with rows of punctures without striae, punctures of rows somewhat larger than punctures on pronotum, most punctures without or some with a very short seta; intervals without punctures and setation; all intervals flat and shining. All femora without teeth or angulations (Fig. 53). All tibiae without distinct sexual dimorphism. Aedeagus unknown.

Remarks: The redescription is based on a ♀ non-type specimen from the type locality Simla in the HNHM. This specimen was compared with the type by the late Dr. Kaszab.

Distribution: India (Himachal Pradesh).

### *Laena mussoorica* **n. sp.**
(Figs. 54–55)

Holotype (♀): India, Uttar Anchal, Mussoorie, Dhanolt, 2250 m, 11.VII.1989, leg. A. Riedel, SMNS.

Etymology: Named after the village Mussoorie, in whose vicinity the holotype has been collected.

Description: Body length 7.5 mm. Eyes not prominent. Pronotum (Fig. 54) with large partly confluent punctures, distance as 0.5–1.0 diameters, all punctures with long erect setae; surface flat and shagreened; lateral margin unbordered; propleura with sparser punctation and shorter setation than on disc. Elytra (Fig. 54) without rows of punctures, with 3 feeble keels and between with irregular rough punctation, punctures as large as punctures on pronotum, most punctures with a longer erect seta; all intervals between keels flat and shagreened. All femora without teeth or angulations (Fig. 55). Sexual dimorphism of tibiae unknown. Aedeagus unknown.

Diagnosis: *Laena mussoorica* n. sp. shares with *L. punctatissima* the dorsal structure of the elytra without rows of punctures, but with three feeble keels and with irregularly punctured surface between these keels. However, *L. punctatissima* is distinctly smaller (body length 4.0 mm), the pronotum has a different subquadrate shape (compare Figs. 64–66), and the dorsal setation is adpressed. These differences, in particular those concerning the pronotal shape, are distinct enough, that I decided to describe *L. mussoorica* n. sp. as a new taxon, despite this description is based on a single female only.

### *Laena orbicollis* Schuster, 1926
(Figs. 56–58)

Studied type material: India, Uttar Anchal, Chakrata Distr., Kanasar, 7050 ft. (2150 m), 14.–22.V.1922, leg. S. N. Chatterjee, 1 ♂ syntype BMNH, designated as lectotype by Schawaller (2002).

Redescription: Body length 5.8 mm. Eyes prominent. Pronotum (Fig. 56) with large punctures, distance as 1–4 diameters, all punctures with long adpressed setae; surface flat and shining; lateral margin bordered; propleura with similar punctation as and shorter setation than on disc. Elytra (Fig. 56) with rows of punctures without striae, punctures of rows larger than punctures on pronotum, all punctures without seta; intervals nearly without punctures and only in the humeral region with a few long erect setae, interval 9 with 1 distinct setiferous pore; all intervals slightly convex and shining. All femora without teeth or angulations (Fig. 57). All tibiae without distinct sexual dimorphism. Apicale of aedeagus see Fig. 58.

Distribution: India (Uttar Anchal).

*Laena parkeri* Schuster, 1935
(Figs. 59–60)

Studied type material: India, Bashahr State, Chini, 9500 ft. (2900 m), V.–VII.1928, leg. R. N. Parker, holotype BMNH (sex not examined).

Redescription: Body length 6.5 mm. Eyes slightly prominent. Pronotum (Fig. 59) with small punctures, distance as 2–4 diameters, most punctures with short adpressed setae; surface flat and shining; lateral margin feebly bordered; propleura with sparser punctation and shorter setation than on disc. Elytra (Fig. 59) with rows of punctures without striae, punctures of rows larger than punctures on pronotum, most punctures with a short seta; intervals with an irregular row of small punctures bearing each a seta of same length; all intervals flat and shagreened. Anterior femur with a distinct angulation (Fig. 60), middle and posterior femora with distinct tooth. Sexual dimorphism of tibiae unknown. Aedeagus unknown.

Distribution: India (Uttar Anchal).

*Laena planipennis* Schuster, 1926

Studied type material: None.

Remarks: The type depository is not stated in the description and the type could not be found in the BMNH. According to the description, *L. planipennis* is similar to *L. indica* and can be distinguished by the unbordered lateral margin of the pronotum and by the flat elytral interval 7 (distincly convex in *L. indica*).

Distribution: India (Uttar Anchal).

*Laena punctatissima* Schuster, 1926
(Figs. 64–66)

Studied type material: India, Uttar Anchal, Kumaon, W Almora Division, XI.1918, leg. H. G. Champion, ♂ holotype BMNH.

Redescription: Body length 4.0 mm. Eyes not prominent. Pronotum (Fig. 64) with large partly confluent punctures, distance as 0.5–1.0 diameters, all punctures with long adpressed setae; surface flat and shining; lateral margin unbordered; propleura with sparser punctation and shorter setation than on disc. Elytra (Fig. 64) without rows of punctures, with 3 feeble keels and between with irregular rough punctation, punctures as large as punctures on pronotum, most punctures with a longer adpressed seta; all intervals between keels flat and shagreened. All femora without teeth or angulations (Fig. 65). All tibiae without distinct sexual dimorphism. Apicale of aedeagus see Fig. 66.

Distribution: India (Uttar Anchal).

*Laena puncticollis* Schuster, 1935
(Figs. 61–63)

Studied type material: India, Uttar Anchal, Kumaon, W Almora Division, V.1919, leg. H. G. Champion, ♂ holotype BMNH.

Redescription: Body length 4.3 mm. Eyes not prominent. Pronotum (Fig. 61) with large punctures, distance as 1–5 diameters, all punctures with long adpressed setae; surface flat and shining; lateral margin unbordered; propleura with sparser punctation and shorter setation than on disc. Elytra (Fig. 61) with rows of punctures without striae, punctures of rows larger than punctures on pronotum, most punctures with a long erect seta; intervals nearly without punctures and setation; all intervals convex and shining. All femora without teeth or angulations (Fig. 62). All tibiae without distinct sexual dimorphism. Apicale of aedeagus see Fig. 63.

Distribution: India (Uttar Anchal).

*Laena rosti* Reitter, 1906
(Figs. 67–69)

Studied type material: India, Kashmir, leg. Rost, ♂ holotype HNHM (left antenna missing).

Redescription: Body length 6.8 mm. Eyes not prominent. Pronotum (Fig. 67) with large punctures, distance as 1–3 diameters, most punctures with short adpressed setae; surface with a pair of feeble impressions and shining; lateral margin marked but unbordered; propleura with larger punctation than on disc and without setation. Elytra (Fig. 67) with rows of punctures without striae, punctures of rows similar as punctures on pronotum, most punctures with small adpressed seta; intervals with an irregular row of small punctures bearing each a seta of same length, interval 9 basally with 1 distinct and posteriorly with 3 indistinct setiferous pores; all intervals slightly convex. All femora without teeth or angulations (Fig. 68). All tibiae without distinct sexual dimorphism. Apicale of aedeagus see Fig. 69.

Distribution: India (Kashmir, Himachal Pradesh).

*Laena similis* Schuster, 1926
(Figs. 70–72)

*Laena transversicollis* Schuster, 1926 (syn.).

Studied type material: India, Mussoorie, Dhobi Ghat, 14.IV.1922, leg. M. Cameron, ♂ holotype of *L. similis* BMNH. – India or., "81.19", leg. F. Bates, holotype of *L. transversicollis* BMNH (sex not examined).

Redescription: Body length 4.8 mm. Eyes slightly prominent. Pronotum (Fig. 70) with large punctures,

distance as 1–3 diameters, most punctures with long adpressed setae; surface flat and shining; lateral margin bordered; propleura with larger punctation than on disc and without setation. Elytra (Fig. 70) with rows of punctures without striae, punctures of rows larger than punctures on pronotum, punctures without or with a very short seta; intervals with an irregular row of very small punctures bearing each a longer adpressed seta; all intervals convex and shining. All femora without teeth or angulations (Fig. 71). All tibiae without distinct sexual dimorphism. Apicale of aedeagus see Fig. 72.

Distribution: India (Uttar Anchal).

### *Laena simlaica* **n. sp.**
(Figs. 73–75)

Holotype (♂): India, Himachal Pradesh, Simla, Kufri, 16.VII.1989, leg. A. Riedel, SMNS.

Paratypes: Same data as holotype, 3 ex. SMNS, 1 ex. HNHM. – India, Himachal Pradesh, 16 km from Simla, Kufri, 2500 m, 15.–17.VII.1989, leg. M. Hiermeier, 1 ex. CRGT.

Etymology: Named after Simla, in whose vicinity the type series was collected.

Description: Body length 5.0–6.3 mm. Eyes not prominent. Pronotum (Fig. 73) with large punctures, distance as 1–5 diameters, some punctures with long adpressed setae; surface flat and shining; lateral margin unbordered; propleura dorsally without and basally with similar punctation as on disc and without setation. Elytra (Fig. 73) with rows of punctures without striae, these rows vanishing in the posterior quarter of the elytra, punctures of rows as large as punctures on pronotum, without setae or microsetae; intervals without punctures and setation; all intervals slightly convex and shining. All femora without teeth or angulations (Fig. 74). All tibiae without peculiarities. Apicale of aedeagus see Fig. 75.

Diagnosis: *L. simlaica* n. sp. can be recognized by the shining dorsal surface, the sphaerical pronotum without any trace of a lateral border, the large but sparse pronotal punctation, the elytral rows vanishing in the posterior part of the elytra, convex elytral intervals without any punctation and setation, unarmed femora, and the shape of the aedeagus. *L. himalayana*, according to description and key of Schuster (1926), and *L. minuta* from the same region around Simla are similar, but both possess a bordered lateral margin of the pronotum and complete elytral rows. Furthermore, *L. himalayana* has prominent eyes (not prominent in *L. minuta* and *L. simlaica* n. sp.). *Laena convexicollis* also possesses a sphaerical pronotum, but the lateral margin is also bordered, the elytral rows are complete and the elytral intervals are punctured.

### *Laena tibialis* Schuster, 1926
(Figs. 76–77)

Studied type material: Without locality data, leg. Bowring "63.47*", ♀ holotype BMNH.

Redescription: Body length 6.0 mm. Eyes not prominent. Pronotum (Fig. 76) with large punctures, distance as 1–4 diameters, all punctures with long setae; surface flat and shagreened; lateral margin bordered; propleura with larger punctation and shorter setation than on disc. Elytra (Fig. 76) with rows of punctures without striae, punctures of rows as large as punctures on pronotum, most punctures with a longer seta; intervals with an irregular row of small punctures bearing each a seta of same length; all intervals flat and shagreened. All femora without teeth or angulations (Fig. 77). Sexual dimorphism of tibiae unknown. Aedeagus unknown.

Remarks: This is a doubtful taxon because of the unclear type locality (see "data" of the type above). The collector, John Bowring, was a British economist, traveller and governor of Hong Kong, but not involved with any place in British India, thus the type might have been collected also in Tibet (in a wider historical sense). The single type is a female and not a male as given in the original description. It seems similar to *L. alticola* Blair, 1923 from Tibet north of the Everest with a broader pronotum (compare figures in Schawaller 2001), and also similar to *L. freudei* Kaszab, 1961 from Nepal, but the latter species has armed femora.

Distribution: Northern India (?), China/Tibet (?).

### *Laena villosa* Schuster, 1935
(Figs. 78–79)

Studied type material: India, S Garhwal, Akeswar, Gauri Dutt. (50–100 miles E Dehra Dun), 16.XII.1923, ♀ holotype BMNH.

Redescription: Body length 5.0 mm. Eyes slightly prominent. Pronotum (Fig. 78) with large punctures, distance as 0.5–2.0 diameters, all punctures with long erect setae; surface flat and shining; lateral margin somewhat marked but unbordered; propleura with similar punctation and same setation as on disc. Elytra (Fig. 78) with rows of punctures without striae, punctures of rows as large as punctures on pronotum, most punctures with a long erect seta; intervals with an irregular row of small punctures bearing each a long seta of same length or even longer; all intervals flat and shining. All femora without teeth or angulations (Fig. 79). Sexual dimorphism of tibiae unknown. Aedeagus unknown.

Distribution: India (Uttar Anchal).

### 3 Key to the species of *Laena* in Uttar Anchal and Himachal Pradesh

The key does not include all diagnostic characters, so it cannot be used for phylogenetic purposes. It is suitable only for males because sexual characters have been used. The types of five taxa (*L. clypealis*, *himalayana*, *lacordairei*, *laevigata*, and *planipennis*) from that region could not be reexamined, therefore these taxa remain unclear and are not included.

**1** All or at least single femora (not tibiae) with distinct or feeble teeth or with angulations. . . . **2**
– All femora without teeth, angulations or other armatures. . . . **11**
**2** Pronotum with unbordered lateral margin. . . . **3**
– Pronotum with distinctly bordered lateral margin. . . . **4**
**3** Body length 10 mm, elytral intervals 7 and 9 without distinct setiferous pores, all elytral intervals flat, all femora with 2 opposite distinct teeth. – Figs. 41–42. . . . ***gebieni***
– Body length 6.8–8.5 mm, elytral intervals 7 and 9 with distinct tooth-like setiferous pores, alternate elytral intervals 3 and 5 distinctly convex, middle and posterior femora with a single distinct tooth. – Figs. 36–38. . . . ***denticrus***
**4** Alternate elytral intervals 3, 5, 7 broader and more convex (nearly keel-like) than intervals 2, 4, 6. – Figs. 23–24. . . . ***carinipennis***
– All intervals on elytral disc of similar structure, sometimes slightly convex but not keel-like. . . . **5**
**5** Punctures of elytral rows in feeble or distinct striae, elytral intervals flat or convex. . . . **6**
– Punctures of elytral rows not in striae, elytral intervals always flat. . . . **8**
**6** Punctures of the elytral rows (not of the intervals) distinctly larger than punctures of the pronotum. – Figs. 49–51. . . . ***kuluana***
– Punctures of the elytral rows as large as punctures of the pronotum. . . . **7**
**7** Body length 8.0 mm, pronotum subquadrate, all elytral intervals flat, all femora with distinct teeth. – Figs. 25–26. . . . ***championi***
– Body length 6.7–7.3 mm, pronotum trapezoid, all elytral intervals convex, anterior and middle femora only with angulations, but not with distinct teeth. – Figs. 34–35. . . ***gardneri***
**8** Punctures of the elytral rows larger than punctures of the pronotum. . . . **9**
– Punctures of the elytral rows as large as punctures of the pronotum. . . . **10**
**9** Anterior femur with a distinct angulation, middle and posterior femora with a distinct tooth, pronotum sphaerical and widest in the middle. – Figs. 59–60. . . . ***parkeri***
– Anterior femur without armature, middle and posterior femora with a quite indistinct tooth, pronotum trapezoid and widest in the anterior third. – Figs. 47–48. . . . ***kaliensis***
**10** Body length 7.0 mm, dorsal surface dull shagreened, elytral setation shorter than width of elytral intervals. – Figs. 14–15. . . . ***bhatiai***
– Body length 5.0–5.5 mm, dorsal surface shining, elytral setation as long as width of elytral intervals. – Figs. 5–7. . . . ***badrinathica* n. sp.**
**11** Pronotum with unbordered lateral margin, sometimes lateral margin somewhat marked but not bordered. . . . **12**
– Pronotum with distinctly bordered lateral margin. . . . **23**
**12** Elytra at least laterally or completely with rough irregular punctation without any separation in rows and intervals, or elytra with three fine keels and between them with roughly and irregularly punctured intervals. . . . **13**
– Elytra with regular punctural rows without striae, and with finely punctured intervals, in a single case (*simlaica* n. sp.) elytral rows vanishing in the posterior part. . . . **16**
**13** Elytra with three fine keels and with roughly and irregularly punctured intervals. . . . **14**
– Elytra at least laterally or completely with rough irregular punctation without any separation in rows and intervals. . **15**
**14** Body length 4.0 mm, pronotum subquadrate with parallel lateral sides, dorsal setation adpressed. – Figs. 64–66. . . . ***punctatissima***
– Body length 7.5 mm, pronotum trapezoid and widest anteriorly, dorsal setation long and erect. – Figs. 54–55. . . . ***mussoorica* n. sp.**
**15** Elytra completely with irregular punctation, pronotum trapezoid and widest anteriorly, dorsal surface dull shagreened, all tibiae without distinct sexual dimorphism. – Figs. 39–40. . . . ***irregularis***
– Elytra only laterally with irregular punctation, inner rows 1 and 2 regular, pronotum quadrate with parallel sides, dorsal surface shining, male anterior tibia medially swollen. – Figs. 18–20. . . . ***blairi***
**16** All elytral intervals slightly or distinctly convex. . . . **17**
– All elytral intervals absolutely flat. . . . **20**
**17** Anterior tibiae of males with a finger-like interior process, pronotum long and narrow. – Figs. 8–10 . . . . ***barclayi* n. sp.**
– All tibiae without peculiarities, pronotum sphaerical. . . . **18**
**18** Punctures of the elytral rows distinctly larger than punctures on pronotum, elytral intervals nearly without punctures, apicale of aedeagus triangular with acute tip, body length 4.3 mm. – Figs. 61–63. . . . ***puncticollis***
– Punctures of the elytral rows similar as punctures on pronotum, elytral intervals without or with punctures, apicale of aedeagus with blunt tip, body length 5.0–6.8 mm. . . . **19**
**19** Elytral punctural rows vanishing in the posterior quarter of elytra, elytral intervals without punctation and setation, pronotum without any impressions, apicale of aedeagus triangular with blunt tip. – Figs. 73–75 . . . . ***simlaica* n. sp.**
– Elytral punctural rows reaching almost tip of elytra, elytral intervals with a row of fine punctures bearing a small adpressed seta, pronotum with a pair of feeble impressions, apicale of aedeagus fingerlike. – Figs. 67–69. . . . ***rosti***
**20** Body length 11.3 mm, dorsal surface dull shagreened. – Figs. 43–44. . . . ***grandis***
– Body length 3.8–7.0 mm, dorsal surface shining. . . . **21**
**21** Dorsal surface of elytra with long and erect setation, eyes slightly prominent, anterior corners of pronotum marked. – Figs. 78–79. . . . ***villosa***
– Dorsal surface of elytra with short adpressed setation, eyes not prominent, anterior corners of pronotum rounded. . . . **22**
**22** Body length 3.8–4.2 mm, pronotum without any impressions, apicale of aedeagus tongue-like with straight sides. – Figs. 2–4. . . . ***almorensis***
– Body length 7.0 mm, pronotum with a pair of feeble impressions, apicale of aedeagus finger-like with sinuated sides. – Figs. 29–31. . . . ***convexicollis***
**23** All elytral intervals completely flat, or only inner intervals flat and intervals 5, 7, 9 convex. . . . **24**
– All elytral intervals slightly or distinctly convex. . . . **27**
**24** Only inner elytral intervals flat, intervals 5, 7, 9 convex, body length 11.0–11.5 mm. . . . **25**
– All elytral intervals completely flat, body length 6.0–4.0 mm. . . . **26**
**25** Head with distinct ocular keel, eyes oval and not prominent, pronotum with dense and confluent punctation. – Figs. 16–17. . . . ***carinata***
– Head without ocular keel, eyes round and prominent, pronotum with large but separated punctation. – Figs. 45–46 . . . . ***indica***

**26** Dorsal surface dull shagreened, pronotum transverse with parallel sides, punctures of elytral rows as large as punctures on pronotum. – Figs. 76–77. . . . . ***tibialis***
– Dorsal surface shining, pronotum trapezoid and widest near anterior third, punctures of elytral rows somewhat larger than punctures on pronotum. – Figs. 52–53. . . . . ***minuta***
**27** Anterior corners of pronotum spine-like. – Figs. 32–33. . . . . ***denticollis***
– Anterior corners of pronotum rounded or somewhat marked. . . . . **28**
**28** Punctures of the elytral rows as large as punctures on pronotum. – Figs. 21–22. . . . . ***cameroni***
– Punctures of the elytral rows larger than punctures on pronotum. . . . . **29**
**29** Pronotum widest in the anterior third, punctures of elytral rows very deeply impressed. – Figs. 11–13. . . . . ***beesoni***
– Pronotum widest in the middle, punctures of elytral rows normally impressed. . . . . **30**
**30** Lateral margin of pronotum slighty excavated near anterior and posterior margins. – Figs. 70–72. . . . . ***similis***
– Lateral margin of pronotum rounded without any irregularities. . . . . **31**
**31** Eyes distinctly prominent, elytral interval 9 with a distinct setiferous pore, body length 5.8 mm. . . . . ***orbicollis***
– Eyes not prominent, elytral interval 9 without distinct setiferous pore, body length 4.8 mm. . . . . ***chatterjeei***

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# Five new epigean species of *Toxocnema* Fåhraeus (Coleoptera: Tenebrionidae) from arboreal habitats in South Africa and Swaziland[1]

Wolfgang Schawaller

Abstract

Five new species of the tenebrionid genus *Toxocnema* Fåhraeus, 1870 (subfamily Stenochiinae Kirby, 1837, tribe Cnodalonini Gistel, 1856, type species *rufitarsis* Fåhraeus, 1870) from South Africa and Swaziland are described (*T. fungicola* **n. sp.**, *T. kochi* **n. sp.**, *T. leleupi* **n. sp.**, *T. minima* **n. sp.** and *T. ruthmuellerae* **n. sp.**). An identification key for the six species of the genus is presented. The species of *Toxocnema* are obligatory inhabitants of the soil litter in mature forest habitats, being distributed in the eastern and southern parts in South Africa, north up to KwaZulu-Natal and Swaziland.

Keywords: Coleoptera, Tenebrionidae, *Toxocnema*, new species, South Africa.

Zusammenfassung

Fünf neue Arten der Tenebrioniden-Gattung *Toxocnema* Fåhraeus, 1870 (Unterfamilie Stenochiinae Kirby, 1837, Tribus Cnodalonini Gistel, 1856, Typusart *rufitarsis* Fåhraeus, 1870) aus Südafrika werden beschrieben (*T. fungicola* **n. sp.**, *T. kochi* **n. sp.**, *T. leleupi* **n. sp.**, *T. minima* **n. sp.** und *T. ruthmuellerae* **n. sp.**). Ein Bestimmungsschlüssel für die sechs Arten der Gattung wird beigefügt. Die *Toxocnema*-Arten sind obligatorische Bewohner der Bodenstreu in ursprünglichen Waldhabitaten, verbreitet in den östlichen und südlichen Teilen Südafrikas und nordwärts bis nach KwaZulu-Natal und Swaziland.

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## 1 Introduction

The tenebrionid genus *Toxocnema* was described by Fåhraeus (1870), based on the type species *rufitarsis* from "Caffraria". Subsequently, for more than a hundred years, nothing else was published about this taxon. During my visits for comparative studies in the Transvaal Museum in Pretoria, I found several recently collected specimens from South Africa among extensive unidentified materials, which represent four new species of this genus. Additionally, I found a few older specimens, which the late Dr. C. Koch obviously already recognized and named as new according to the labels, but which he could not publish before his death in 1970. C. Koch also studied and dissected the type species *T. rufitarsis*, deposited in the Naturhistoriska Riksmuseet Stockholm, being a further evidence for his projected study of that genus, which was unfortunately unfinished. An additional fifth new species was discovered in the Museum in Berlin among unidentified African tenebrionids.

In the world catalogue of Tenebrionidae, Gebien (1942) placed the genus *Toxocnema* Fåhraeus, 1870 in the tribe Misolampini Reitter, 1917. Following the recent family classification (Bouchard et al. 2005), *Toxocnema* possesses all characters of the subfamily Stenochiinae Kirby, 1837, tribe Cnodalonini Gistel, 1856. However, at present state of knowledge I feel unable to name any related genus or even sister group. Either my knowledge about the South African tenebrionid fauna is too poor or (already) the sister group of *Toxocnema* does not occur on the African continent. It cannot be ruled out that it might be found on Madagascar (where several genera of Cnodolanini are present, in contrast to South Africa).

According to my own experiences during field work, and to information on the labels, the species of *Toxocnema* are obligatory inhabitants of the soil litter in mature forest habitats. They are endemic in the eastern and southern parts in South Africa occurring northwards up to KwaZulu-Natal and Swaziland (see map Fig. 1). Recent field work in adjacent Mozambique by Ruth Müller and other expe-

[1] Contributions to Tenebrionidae, no. 75. – For no. 74 see: Stuttgarter Beiträge zur Naturkunde A, Neue Serie 2 (2009).

**Fig. 1.** Idealized distributional patterns of *Toxocnema* spp. in arboreal habitats of South Africa and Swaziland.

rienced collectors yielded no specimens of *Toxocnema*. The epigean congeners can be collected successfully by sifting soil litter mixed with rotten tree branches in coastal forests as well as in mountainous forests of that area. The adult beetles and/or larvae are probably somehow associated with soil fungi. In some localities, at least two species live syntopically.

Acronyms of depositories

BMNH The Natural History Museum, London, United Kingdom
MNHUB Museum für Naturkunde der Humboldt Universität, Berlin, Germany
SMNH Naturhistoriska Riksmuseet, Stockholm, Sweden
SMNS Staatliches Museum für Naturkunde, Stuttgart, Germany
TMSA Transvaal Museum, Pretoria, South Africa

Acknowledgements

For the trustful loan of material, for kind hospitality during my visits in the Transvaal Museum in Pretoria, and for various support during joint field work in southern Africa I thank Ruth Müller (Transvaal Museum Pretoria). South African authorities kindly provided collecting permits of own travels in cooperation with the Transvaal Museum. Max Barclay (The Natural History Museum London) and Bernd Jäger and Dr. Manfred Uhlig (both Museum für Naturkunde Berlin) kindly loaned specimens from the collection under their care. Immediately upon request, Julio Ferrer (Naturhistoriska Riksmuseet Stockholm) sent photographs of the holotype of *Toxocnema rufitarsis*. Johannes Reibnitz (Staatliches Museum für Naturkunde Stuttgart) prepared the photographs of the present paper by using a Leica DFC 480 digital camera on a Leica MZ16 APO microscope. The digital photographs were subsequently processed by him using Leica LAS software. Thanks are also due to the referees Dr. Kiyoshi Ando (Osaka) and Dr. Ottó Merkl (Budapest) for their comments and corrections.

## 2 Taxonomy

### *Toxocnema fungicola* **n. sp.**
(Figs. 2, 8)

Holotype (♂): RSA [= Republic of South Africa], Eastern Cape (Transkei), Ntsubane Forest, 1.–6.XII.1988, leg. S. Endrödy-Younga, TMSA.

Paratypes: Same data as holotype, 2 ex. TMSA, 2 ex. SMNS. – RSA, Eastern Cape (Transkei), Silaka Forest Reserve, 30.XI.–2.XII.1987, leg. S. ENDRÖDY-YOUNGA, 4 ex. TMSA. – RSA, Eastern Cape (Transkei), Dwesa Forest, 11.XII.1979, leg. S. ENDRÖDY-YOUNGA, 1 ex. TMSA. – RSA, Eastern Cape (Transkei), Dwesa Forest Reserve (The Haven), 4.–6.XII.2003, leg. W. SCHAWALLER, 1 ex. SMNS. – RSA, Eastern Cape (Transkei), Mbotyi Coastal Forest, 29.XI.–3.XII.2003, leg. W. SCHAWALLER, 3 ex. SMNS. – RSA, Eastern Cape (Ciskei), Amatole, Pirie Forest, 8.XII.1987, leg. S. ENDRÖDY-YOUNGA, 6 ex. TMSA, 3 ex. SMNS, 1 ex. BMNH. – RSA, Eastern Cape, N Fort Beaufort, Fort Fordyce Nature Reserve, 1000 m, 3.–5.XII.2007, leg. R. MÜLLER & W. SCHAWALLER, 5 ex. TMSA, 3 ex. SMNS. – RSA, Eastern Cape, Port St. Johns, Nxolveni Forest, XII.1961, leg. N. LELEUP, 1 ex. TMSA.

Etymology: Named after the mode of life being very probably associated with soil fungi.

Description: Dorsal side (Fig. 2) dark ferrugineous without colour pattern, elytra sometimes somewhat lighter, without any metallic shine, surface shining and without setation, appendages also dark ferrugineous. Head with large, partly confluent punctation, frons behind eyes with a transverse impression. Eyes feebly excavated by the genae. Antennae without separated club, shape of the antennomeres see Fig. 2. Pronotum (Fig. 2) conical, anterior corners rounded, lateral margins not sinuate before hind corners; surface with punctation distinctly finer than on head, disc distinctly convex without any impressions and shining; anterior margin unbordered in the middle, lateral and basal margins completely bordered, without subbasal impressions; propleura shining, without punctation or other microstructure; prosternal apophysis conical, pointing posteriorly. Elytra (Fig. 2) short oval, elytron with 8 complete striae, without punctural rows, with traces of scutellar striolae; internal intervals feebly and external intervals distinctly convex in both sexes, without punctation; shoulders pronounced; epipleura extremely broad at the base and somewhat diminishing before apex, shining and nearly without punctation. Abdominal ventrites without setation, intersegmental membranes visible between ventrites 3 and 4 and between 4 and 5, last visible ventrite 5 unbordered. Legs without modifications, tibiae rounded in cross section, without any keel. Aedeagus (Fig. 8) with finger-like sinuate apicale, not sinuate in lateral view, basale feebly bent and narrow in lateral view. Body length 2.8–4.0 mm.

Diagnosis: This new species is characterized by small body size, shining dorsal surface, conical pronotum with the lateral margins not sinuate before the posterior corners and with disc distinctly convex, pronotal punctation distinctly finer than on head, propleura without microstructure, the short oval, nearly round elytra, and the shape of the aedeagus. For taxonomic separation from the other species of the genus see identification key and Figs. 2–12.

## *Toxocnema kochi* **n. sp.**
(Figs. 3, 9)

Holotype (♂): RSA, Eastern Cape (Transkei), Ntsubane Forest, 1.XII.1988, leg. S. ENDRÖDY-YOUNGA, TMSA.

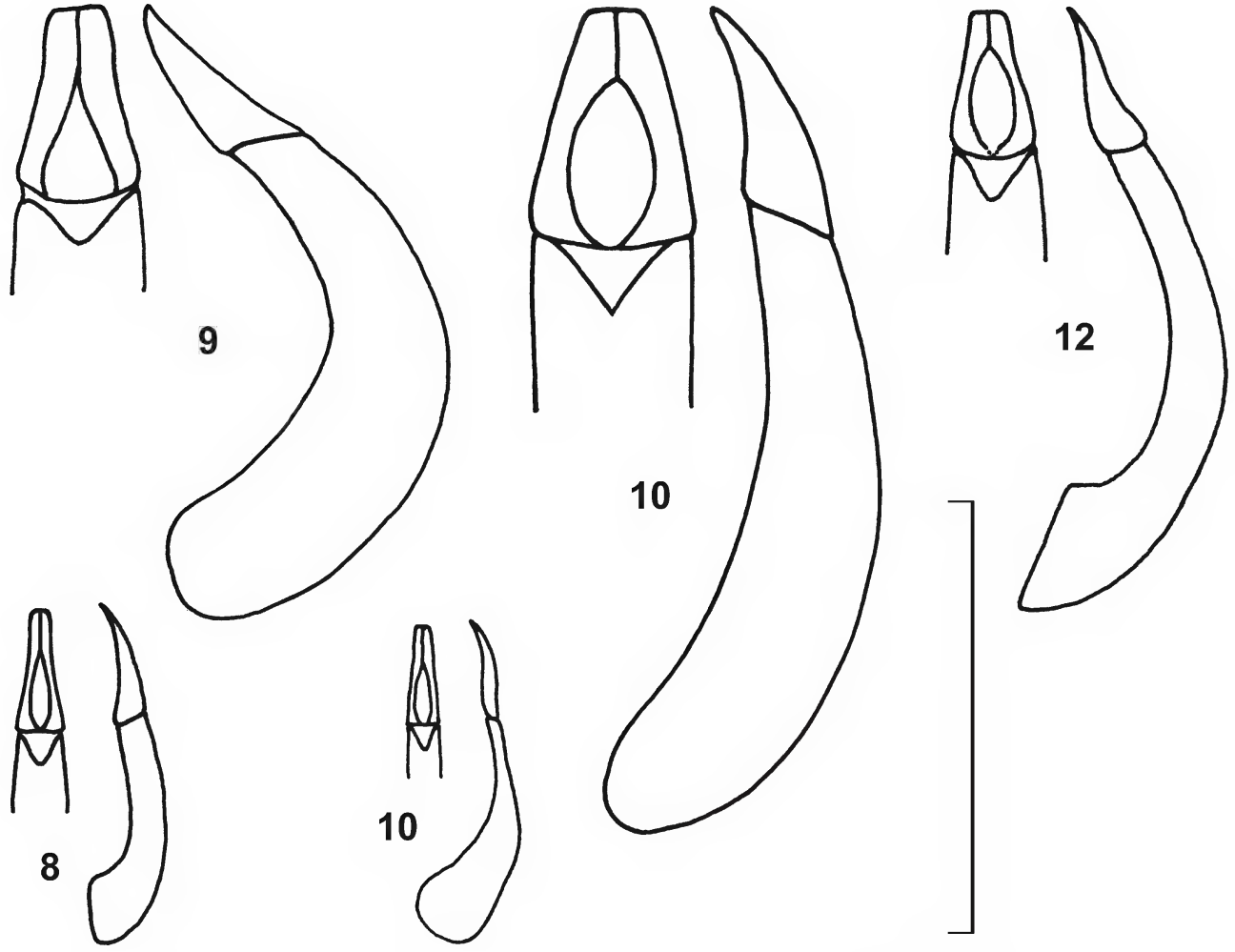
Paratypes: Same data as holotype, 5 ex. TMSA, 3 ex. SMNS, 1 ex. BMNH. – RSA, Eastern Cape (Transkei), Silaka Forest Reserve, 24.–30.XI.1987, leg. S. ENDRÖDY-YOUNGA, 4 ex. TMSA, 2 ex. SMNS. – RSA, Eastern Cape, Port St. Johns, Nxolveni Forest, XII.1961, leg. N. LELEUP, 1 ex. TMSA. – RSA, Eastern Cape, Alexandria Forest Station, 4.–6.XII.1987, leg. S. ENDRÖDY-YOUNGA, 6 ex. TMSA, 2 ex. SMNS. – RSA, KwaZulu-Natal, Alfred Distr., Oribi Gorge, X.1961, leg. N. LELEUP, 1 ex. TMSA.

Etymology: Named in honour of the late Dr. CARLO KOCH (1904–1970), former curator of Coleoptera in the Transvaal Museum in Pretoria, founder of the Gobabeb Research Station in the Namib desert (1962), and productive monographer of the South African (and Mediterranean) tenebrionid fauna.

Description: Dorsal side (Fig. 3) dark ferrugineous without colour pattern, without any metallic shine, surface shining and without setation, appendages light ferrugineous. Head with larger, partly confluent punctation, frons behind eyes with a transverse impression. Eyes feebly excavated by the genae. Antennae without separated club, shape of the antennomeres see Fig. 3. Pronotum (Fig. 3) subquadrate, anterior corners rounded, posterior corners rectangular, lateral margins parallel before hind corners and not sinuate; surface with dense punctation distinctly finer than on head, disc slightly convex without any impressions and shining; anterior margin unbordered in the middle, lateral and basal margins completely bordered, without subbasal impressions; propleura shining, without punctation or other microstructure; prosternal apophysis conical, pointing posteriorly. Elytra (Fig. 3) elongate oval, elytron with 8 complete striae, without punctural rows, without scutellar striolae; intervals feebly convex (♂) or nearly flat (♀), with scattered punctation distinctly finer than on pronotum; shoulders pronounced; epipleura extremely broad at the base and somewhat diminishing before apex, shining and with punctation as on elytral intervals. Abdominal ventrites without setation, intersegmental membranes visible between ventrites 3 and 4 and between 4 and 5, last visible ventrite 5 unbordered. Legs without modifications, tibiae rounded in cross section, without any keel. Aedeagus (Fig. 9) with spade-like apicale, basale strongly bent and broad in lateral view. Body length 3.0–5.2 mm.

Diagnosis: This species is distinguished by small body size, shining dorsal surface, subquadrate pronotum with the lateral margins not sinuate before the posterior corners and with disc feebly convex, pronotal punctation dense but distinctly finer than on head, propleura without microstructure, long and nearly parallel-sided elytra, and the shape of the aedeagus. For taxonomic separation from

**Figs. 2–7.** *Toxocnema* spp., dorsal views. – **2**. *T. fungicola* n. sp., ♂ holotype. **3**. *T. kochi* n. sp., ♂ holotype. **4**. *T. ruthmuellerae* n. sp., ♂ holotype. **5**. *T. rufitarsis*, non-type ♀. **6**. *T. minima* n. sp., ♂ holotype. **7**. *T. leleupi* n. sp., ♀ holotype. – Scale: 4 mm.




**Figs. 8–12.** *Toxocnema* spp., aedeagi. – **8**. *T. fungicola* n. sp., ♂ holotype. **9**. *T. kochi* n. sp., ♂ holotype. **10**. *T. minima* n. sp., ♂ holotype. **11**. *T. rufitarsis*, non-type ♂. **12**. *T. ruthmuellerae* n. sp., ♂ holotype. – Scale: 1 mm.

the other species of the genus see identification key and Figs. 2–12.

### *Toxocnema leleupi* **n. sp.**
(Fig. 7)

Holotype (♀): NW Swaziland, Piggs Peak, X.1961, leg. N. Leleup, TMSA.

Paratypes: Same data as holotype, 1 ♀ TMSA, 1 ♀ SMNS. – RSA, KwaZulu-Natal, Ingwavuma Distr., Gwaliweni Forest, X.1961, leg. N. Leleup, 1 ♀ TMSA.

Etymology: Named in honour of the late Narcisse Leleup (1912–2001), former collaborator of the Royal Museum for Central Africa in Tervuren (Belgium), collector of the type series and several other epigean Coleoptera in tropical Africa.

Description: Dorsal side (Fig. 7) dark ferrugineous without colour pattern, without any metallic shine, surface shining and without setation, appendages also dark ferrugineous. Head with larger, partly confluent punctation, frons behind eyes with a transverse impression. Eyes feebly excavated by the genae. Antennae without separated club, shape of the antennomeres see Fig. 7. Pronotum (Fig. 7) subquadrate, anterior corners rounded, posterior corners rectangular, lateral margins before hind corners sinuate; surface with dense but not confluent punctation, punctures only slightly smaller than on head, disc slightly convex without any impressions and shining; anterior margin unbordered in the middle, lateral and basal margins completely bordered, without subbasal impressions; propleura shining and with longitudinal wrinkles; prosternal apophysis conical, pointing posteriorly. Elytra (Fig. 7) broad oval, elytron with 8 complete striae, without punctural rows, with traces of scutellar striolae; internal intervals flat, external intervals feebly convex, with scat-

tered punctation distinctly finer than on pronotum; shoulders pronounced; epipleura extremely broad at the base and somewhat diminishing before apex, shining and without punctation. Abdominal ventrites without setation, intersegmental membranes visible between ventrites 3 and 4 and between 4 and 5, last visible ventrite 5 unbordered. Legs without modifications, tibiae rounded in cross section, without any keel. Aedeagus unknown (only females available). Body length 4.5–5.5 mm.

Diagnosis: Characterized by medium body size, shining dorsal surface, subquadrate pronotum with the lateral margins sinuate before the posterior corners, dense pronotal punctation similar to that on head, longitudinally wrinkled propleura, and oval elytra; aedeagus unknown. For taxonomic separation from the other species of the genus see identification key and Figs. 2–7.

Remarks: This species is recognized by its external characters, therefore it is here named as a new species without having males available. The specimens represent the northernmost records of the genus *Toxocnema* which are disjunct from the other species' distribution ranges (map Fig. 1).

### *Toxocnema minima* **n. sp.**
(Figs. 6, 10)

Holotype (♂): RSA, Natal, Umhlanga near Durban, 27.VII.1997, leg. H. Meybohm, MNHUB.

Paratypes: Same data as holotype, 17 ex. MNHUB, 3 ex. SMNS, 2 ex. TMSA.

Etymology: The species is named after the small body size, as it is the smallest among its congeners.

Description: Dorsal side (Fig. 6) dark ferrugineous without colour pattern, elytra sometimes somewhat lighter, without any metallic shine, surface shining and without setation, appendages also dark ferrugineous. Head with large, partly confluent punctation, frons behind eyes with a transverse impression. Eyes feebly excavated by the genae. Antennae without separated club, shape of the antennomeres see Fig. 6. Pronotum (Fig. 6) conical, anterior corners rounded, lateral margins before hind corners not sinuate; surface with punctation distinctly finer than on head, disc distinctly convex without any impressions and shining; anterior margin unbordered in the middle, lateral margin completely bordered, basal margin unbordered, without subbasal impressions; propleura shining, without punctation or other microstructure; prosternal apophysis conical, pointing posteriorly. Elytra (Fig. 6) short oval, elytron with 8 complete striae, with traces of punctural rows, with traces of scutellar striolae; internal intervals feebly and external intervals distinctly convex in both sexes, with scattered punctation distinctly finer than on pronotum; shoulders pronounced; epipleura extremely broad at the base and somewhat diminishing before apex, shining and with punctation as on elytral intervals. Abdominal ventrites without setation, intersegmental membranes visible between ventrites 3 and 4 and between 4 and 5, last visible ventrite 5 unbordered. Legs without modifications, tibiae rounded in cross section, without any keel. Aedeagus (Fig. 10) with finger-like parallel apicale, sinuate in lateral view, basale feebly bent and narrow in lateral view. Body length 2.0–2.7 mm.

Diagnosis: Distinguished by small body size, shining dorsal surface, conical pronotum with the lateral margins not sinuate before the posterior corners and with disc distinctly convex, pronotal punctation distinctly finer than on head, propleura without microstructure, short oval nearly round elytra, and the shape of the aedeagus. For taxonomic separation from the other species of the genus see identification key and Figs. 2–12.

### *Toxocnema rufitarsis* Fåhraeus, 1870
(Figs. 5, 11)

Studied type material (photographs): Caffraria [= NE South Africa], leg. J. Wahlberg, ♂ holotype SMNH, dissected by C. Koch. – Photographs were used because the holotype is too fragile to be sent by mail.

New material: RSA, KwaZulu-Natal, Port Natal [= Durban], without date, 3 ex. BMNH (det. C. Koch). – RSA, KwaZulu-Natal, Durban, without date, 1 ♀ TMSA (det. C. Koch). – RSA, KwaZulu-Natal, mouth of Umkomaas River, IX.1897, leg. G. A. K. Marshall, 1 ♂, 1 ♀ BMNH. – RSA, KwaZulu-Natal, Alfred Distr., Oribi Gorge, X.1961, leg. N. Leleup, 1 ♀ SMNS. – RSA, Eastern Cape (Transkei), Ntsubane Forest, 1.XII.1988, leg. S. Endrödy-Younga, 1 ♀ TMSA.

Redescription: Dorsal side (Fig. 5) dark ferrugineous without colour pattern, without any metallic shine, surface shagreened and without setation, appendages also dark ferrugineous. Head with larger, partly confluent punctation, frons behind eyes with a transverse impression. Eyes feebly excavated by the genae. Antennae without separated club, shape of the antennomeres see Fig. 5. Pronotum (Fig. 5) trapezoid, anterior corners somewhat marked but not protruding, lateral margins distally irregularly narrowed, lateral sides before hind corners not sinuate; surface with punctation distinctly finer than on head, disc distinctly convex without any impressions and shagreened; anterior margin unbordered in the middle, lateral and basal margins completely bordered, with 2 feeble impressions before basal margin; propleura shagreened, without punctation or other microstructure; prosternal apophysis conical, pointing posteriorly. Elytra (Fig. 5) broad oval, elytron with 8 complete striae, without punctural rows, without scutellar striolae; intervals convex (in 1 ♀ distinctly, in 2 ♀♀ slightly), with scattered fine punctation as on pronotum; shoulders pronounced (in 1 ♀ only edged, in 2 ♀♀ nearly knob-like); epipleura extremely broad at the base and somewhat diminishing before apex,

shagreened and without punctation. Abdominal ventrites without setation, intersegmental membranes visible between ventrites 3 and 4 and between 4 and 5, last visible ventrite 5 unbordered. Legs without modifications, tibiae rounded in cross section, without any keel. Aedeagus (Fig. 11) with spade-like apicale, basale feebly bent and broad in lateral view. Body length 7.0–7.5 mm.

Identification: This species is characterized by large body size, shagreened dorsal surface, trapezoid pronotum with the lateral margins not sinuate before the posterior corners and with disc distinctly convex, pronotal punctation distinctly finer than on head, propleura without microstructure, broad oval elytra, and the shape of the aedeagus. For taxonomic separation from the other species of the genus see identification key and Figs. 2–12.

Distribution: South Africa (KwaZulu-Natal, Eastern Cape).

### *Toxocnema ruthmuellerae* **n. sp.**
(Figs. 4, 12)

Holotype (♂): RSA, Western Cape, Lily Vlei NR, IX.1983–III.1984, leg. J. Koen, TMSA.

Paratypes: Same data as holotype, 8 ex. TMSA, 4 ex. SMNS. – RSA, Western Cape, Knysna, 300 m, 1.II.2004, leg. P. Hlaváč, 1 ex. SMNS. – RSA, Eastern Cape (Transkei), Mbotyi Coastal Forest, 29.XI.–3.XII.2003, leg. W. Schawaller, 1 ex. SMNS.

Etymology: Named in honour of Ruth Müller, collection manager for Coleoptera in the Transvaal Museum in Pretoria, for her hospitality and various support during my visits in the museum and during joint field work.

Description: Dorsal side (Fig. 4) dark ferrugineous without colour pattern, without any metallic shine, surface shining and without setation, appendages also dark ferrugineous. Head with larger, partly confluent punctation, frons behind eyes with a transverse impression. Eyes feebly excavated by the genae. Antennae without separated club, shape of the antennomeres see Fig. 4. Pronotum (Fig. 4) subquadrate, anterior corners rounded, posterior corners rectangular, lateral margins before hind corners parallel and not sinuate; surface with punctation distinctly finer than on head, disc slightly convex without any impressions and shining; anterior margin unbordered in the middle, lateral and basal margins completely bordered, without subbasal impressions; propleura shining, without punctation or other microstructure; prosternal apophysis conical, pointing posteriorly. Elytra (Fig. 4) broad oval, elytron with 8 complete striae, without punctural rows, without scutellar striolae; intervals feebly convex (♂) or nearly flat (♀), with scattered punctation distinctly finer than on pronotum; shoulders pronounced; epipleura extremely broad at the base and somewhat diminishing before apex, shining and with punctation as on elytral intervals. Abdominal ventrites without setation, intersegmental membranes visible between ventrites 3 and 4 and between 4 and 5, last visible ventrite 5 unbordered. Legs without modifications, tibiae rounded in cross section, without any keel. Aedeagus (Fig. 12) with spade-like apicale, basale feebly bent and narrow in lateral view. Body length 5.0–5.5 mm.

Diagnosis: Distinguished by medium body size, shining dorsal surface, subquadrate pronotum with the lateral margins not sinuate before the posterior corners and with disc slightly convex, pronotal punctation distinctly finer than on head, propleura without microstructure, oval elytra, and the shape of the aedeagus. For taxonomic separation from the other species of the genus see identification key and Figs. 2–12.

### 3 Key to the species of *Toxocnema*

**1** Body length 7.0–7.5 mm; dorsal surface of pronotum and elytra dull shagreened. – Figs. 5, 11. . . . . ***rufitarsis***
– Body length 2.0–5.5 mm; dorsal surface of pronotum and elytra shining. . . . . **2**
**2** Pronotal punctation dense and large, similar to that on head; lateral margins of pronotum sinuate before posterior corners; propleura with longitudinal wrinkles. – Fig. 7. . . . . ***leleupi* n. sp.**
– Pronotal punctation distinctly finer than on head; lateral margins of pronotum not sinuate before posterior corners; propleura without microstructure. . . . . **3**
**3** Body smaller in the average (2.0–4.0 mm), rounded; pronotum conical, with weak punctation. . . . . **4**
– Body larger (3.0–5.5 mm), of oval shape; pronotum subquadrate, lateral margins parallel in the basal part. . . . . **5**
**4** Body length 2.0–2.7 mm; pronotum 1.8 times as wide as long; elytral striae with traces of punctural rows; apicale of aedeagus sinuate in lateral view. – Figs. 6, 10. . . . . ***minima* n. sp.**
– Body length 2.8–4.0 mm; pronotum 1.2 times as wide as long; elytral striae without punctural rows; apicale not sinuate in lateral view. – Figs. 2, 8. . . . . ***fungicola* n. sp.**
**5** Body broader oval; body and legs dark ferrugineous; aedeagus narrow, feebly bent in lateral view. – Figs. 4, 12. . . . . ***ruthmuellerae* n. sp.**
– Body more elongate oval; body dark ferrugineous, legs lighter; aedeagus broad, strongly bent in lateral view. – Figs. 3, 9. . . . . ***kochi* n. sp.**

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# New genera and species of Zeugophorinae and Eumolpinae (Coleoptera: Chrysomelidae) from New Guinea

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Abstract

Two genera of the chrysomelid subfamily Eumolpinae, *Gressittella* **n. gen.**, *Gressittana* **n. gen.**, and 56 species of the subfamilies Zeugophorinae and Eumolpinae from New Guinea are described as new for science: Zeugophorinae: *Zeugophora papuana* **n. sp.**; Eumolpinae: *Iviva striata* **n. sp.**, *I. antennata* **n. sp.**, *I. diversipunctata* **n. sp.**, *Rhyparidella weisei* **n. sp.**, *R. rufocapitis* **n. sp.**, *R. ovipennis* **n. sp.**, *R. fulva* **n. sp.**, *R. nigripennis* **n. sp.**, *R. suturalis* **n. sp.**, *R. riedeli* **n. sp.**, *Phainodina femorata* **n. sp.**, *P. antennalis* **n. sp.**, *P. riedeli* **n. sp.**, *Stethotes carinata* **n. sp.**, *S. riedeli* **n. sp.**, *S. basipennis* **n. sp.**, *S. obscura* **n. sp.**, *S. dentata* **n. sp.**, *S. schawalleri* **n. sp.**, *S. aethiops* **n. sp.**, *S. papuana* **n. sp.**, *S. armata* **n. sp.**, *S. basifasciata* **n. sp.**, *S. bryanti* **n. sp.**, *S. rufula* **n. sp.**, *S. viridissima* **n. sp.**, *S. tristis* **n. sp.**, *S. laevicollis* **n. sp.**, *S. fulvicornis* **n. sp.**, *S. rubripes* **n. sp.**, *S. aenea* **n. sp.**, *S. costipennis* **n. sp.**, *S. gressitti* **n. sp.**, *S. balyi* **n. sp.**, *S. iriana* **n. sp.**, *S. granulifrons* **n. sp.**, *S. nigripalpis* **n. sp.**, *S. obscurata* **n. sp.**, *S. tarsalis* **n. sp.**, *S. carbonaria* **n. sp.**, *S. nigrescens* **n. sp.**, *S. jacobyi* **n. sp.**, *S. arachnoides* **n. sp.**, *S. hirticollis* **n. sp.**, *Gressittella riedeli* **n. sp.**, *G. obscura* **n. sp.**, *G. laevis* **n. sp.**, *Scelodonta iriana* **n. sp.**, *Cleorina riedeli* **n. sp.**, *C. pulchra* **n. sp.**, *C. flavipes* **n. sp.**, *C. femorata* **n. sp.**, *C. schawalleri* **n. sp.**, *C. bryanti* **n. sp.**, *C. nigricornis* **n. sp.** Keys for the genera *Iviva* and *Cleorina* are given. The large genus *Stethotes* is divided into a few preliminary groups. New faunistic records are provided for several species of the Eumolpinae.

Key words: Chrysomelidae, Zeugophorinae, Eumolpinae, New Guinea, new taxa.

Zusammenfassung

Zwei Gattungen der Subfamilie Eumolpinae, *Gressittella* **n. gen.** und *Gressittana* **n. gen.**, und 56 Arten der Subfamilien Zeugophorinae und Eumolpinae aus Neu Guinea werden als neu für die Wissenschaft beschrieben: Zeugophorinae: *Zeugophora papuana* **n. sp.**; Eumolpinae: *Iviva striata* **n. sp.**, *I. antennata* **n. sp.**, *I. diversipunctata* **n. sp.**, *Rhyparidella weisei* **n. sp.**, *R. rufocapitis* **n. sp.**, *R. ovipennis* **n. sp.**, *R. fulva* **n. sp.**, *R. nigripennis* **n. sp.**, *R. suturalis* **n. sp.**, *R. riedeli* **n. sp.**, *Phainodina femorata* **n. sp.**, *P. antennalis* **n. sp.**, *P. riedeli* **n. sp.**, *Stethotes carinata* **n. sp.**, *S. riedeli* **n. sp.**, *S. basipennis* **n. sp.**, *S. obscura* **n. sp.**, *S. dentata* **n. sp.**, *S. schawalleri* **n. sp.**, *S. aethiops* **n. sp.**, *S. papuana* **n. sp.**, *S. armata* **n. sp.**, *S. basifasciata* **n. sp.**, *S. bryanti* **n. sp.**, *S. rufula* **n. sp.**, *S. viridissima* **n. sp.**, *S. tristis* **n. sp.**, *S. laevicollis* **n. sp.**, *S. fulvicornis* **n. sp.**, *S. rubripes* **n. sp.**, *S. aenea* **n. sp.**, *S. costipennis* **n. sp.**, *S. gressitti* **n. sp.**, *S. balyi* **n. sp.**, *S. iriana* **n. sp.**, *S. granulifrons* **n. sp.**, *S. nigripalpis* **n. sp.**, *S. obscurata* **n. sp.**, *S. tarsalis* **n. sp.**, *S. carbonaria* **n. sp.**, *S. nigrescens* **n. sp.**, *S. jacobyi* **n. sp.**, *S. arachnoides* **n. sp.**, *S. hirticollis* **n. sp.**, *Gressittella riedeli* **n. sp.**, *G. obscura* **n. sp.**, *G. laevis* **n. sp.**, *Scelodonta iriana* **n. sp.**, *Cleorina riedeli* **n. sp.**, *C. pulchra* **n. sp.**, *C. flavipes* **n. sp.**, *C. femorata* **n. sp.**, *C. schawalleri* **n. sp.**, *C. bryanti* **n. sp.**, *C. nigricornis* **n. sp.** Für die Gattungen *Iviva* und *Cleorina* werden Artenschlüssel gegeben. Für die umfangreiche Gattung *Stethotes* werden einige vorläufige Gruppen gebildet. Für mehrere Arten der Eumolpinae werden neue faunistische Angaben gemacht.

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## 1 Introduction

In 2006 Dr. Wolfgang Schawaller invited me to visit the Staatliches Museum für Naturkunde in Stuttgart for studying large undetermined material of the family Chrysomelidae from New Guinea. As a result of this study, two new genera and 55 new species of Eumolpinae were found, as well as one new species of Zeugophorinae.

The Chrysomelidae of New Guinea, and especially the subfamily Eumolpinae, are still very poorly known. Gressitt (1966, 1967a, 1967b, 1969) studied this group and described numerous new species. He saw about 5000 specimens, nearly all from Papua New Guinea. According to his data (1967a), at least 1000 species of this subfamily are expected to occur in New Guinea, probably belonging to at least 50 genera, about half of which as yet unnamed.

I have personally studied almost 10000 specimens from New Guinea, four-fifths of them from Irian Jaya (now West Papua). The tribe Metachromini strongly dominated in the material seen by me (more than 9000 specimens), while the tribe Typophorini (genus *Cleorina* Lefèvre, 1885) included 111 specimens and the tribe Scelodontini only three. It is very interesting, that species-rich genera like *Colasposoma* Laporte, 1833 and *Colaspoides* Laporte, 1833, which are widely distributed in the Oriental region, are absent in New Guinea.

Nearly all material dealt with in the present paper was collected by Dr. Alexander Riedel (Karlsruhe), who made several excursions to Papua New Guinea and Irian Jaya between 1992 and 2000, and who deposited large part of his collectings in the SMNS.

An etymology is only given when names are derived from persons.

Acronyms of depositories

| | |
|---|---|
| BMNH | The Natural History Museum, London, United Kingdom |
| LM | Collection of Dr. Lev N. Medvedev, Moscow, Russia |
| SMNS | Staatliches Museum für Naturkunde, Stuttgart, Germany |

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I am grateful to Dr. W. Schawaller (SMNS) for the opportunity to study this interesting material, and to Dr. S. Shute (BMNH) for the loan of types. Dr. A. Riedel (Karlsruhe) kindly answered some questions on the localities. Special thanks are extended to J. Reibnitz (SMNS) who prepared the photographs of the present paper by using a Leica DFC 480 digital camera on a Leica MZ16 APO microscope. Dr. W. Schawaller and an anonymous reviewer made valuable suggestions on the manuscript.

## 2 Taxonomy

### 2.1 Subfamily Zeugophorinae

*Zeugophora papuana* **n. sp.**
(Fig. 59)

Holotype (sex not determined): Papua New Guinea, Morobe Prov., Mindik, 1400–1550 m, 27.IV.1998, leg. A. Riedel (SMNS).

Description

Fulvous, 7 apical antennal segments slightly darkened, elytra metallic violaceous, underside black with apical abdominal segment fulvous. Upperside with a white pubescence.

Body robust. Head impunctate, clypeus divided from frons by a deep furrow, eyes nearly not emarginated. Antennae reaching to the anterior third of the elytra, the 7 apical segments slightly thickened, proportions of segments 10-7-8-11-8-7-7-7-7-6-9, segment 4 about 4 times, preapical segments about 1.5–1.6 times as long as wide. Prothorax 1.4 times as wide as long, with large and rounded lateral protuberance, posteriorly forming a distinct obtuse angle with the lateral margin, surface with deep and moderately dense punctures. Scutellum triangular with obtuse apex. Elytra 1.45 times as long as wide, not impressed, but slightly flattened in basal third, densely and deeply punctate, with interspaces narrow, slightly convex and shining. Mid tibiae distinctly curved. Body length 3.3 mm.

Diagnosis

This new species is similar to *Z. setsukoae* Gressitt, 1965, but has a smaller body, entirely metallic elytra, entirely fulvous legs, different proportions of the antennal segments, and the eyes not emarginated.

### 2.2 Subfamily Eumolpinae

#### 2.2.1 Tribe Metachromini

Genus *Iviva* Gressitt, 1969

*Iviva striata* **n. sp.**
(Fig. 60)

Holotype (♀): New Guinea, Irian Jaya, Jayawijaya, Diuremna, 1900–2100 m, 9.–11.IX.1992, leg. A. Riedel (SMNS).

Paratypes: Same data as holotype, 2 ♀♀ (SMNS, LM). – New Guinea, Irian Jaya, Jayawijaya, Taramlu, 1500–1700 m, 6.IX.1993, leg. A. Riedel, 1 ♀ (SMNS). – New Guinea, Irian Jaya, Jayawijaya, Bime, 1600–1900 m, 11.IX.1993, leg. A. Riedel, 1 ♀ (SMNS).

Description

Black, upperside or at least elytra with a very slight blue or green sheen, antennae fulvous with segments 5–7 and upperside of segment 1 black, pygidium and sometimes abdominal sternites dark fulvous, tarsi piceous.

Head finely and sparsely punctate, frons wide, not less than twice as wide as eye. Antennae reaching to base of elytra, the 6 apical segments thickened, proportions of segments 7-5-5-5-5-5-5-5-5-8, preapical segments 1.8 times as long as wide. Prothorax 1.7 times as wide as long, strongly narrowed anteriorly, lateral margins rounded, surface shining, finely and sparsely punctate. Scutellum triangular with a broadly rounded apex, as long as wide, shining and impunctate. Elytra as long as wide, humeral carina disappearing behind the middle, surface with regular rows of punctures, more or less confused near suture and humeral ridge, interspaces wide and impunctate; there is also a moderately deep impression just behind humerus on innerside of humeral carina. Pseudoepipleura wide, with 2 irregular rows of punctures. Epipleura narrow, disappearing behind the middle. Femora each with an

acute tooth. Hind tarsal segment 1 barely longer than segment 2. Body length 2.8–3.3 mm, width 2.1–2.4 mm.

### Diagnosis

The new species differs from *I. coccinelloides* Gressitt, 1969 in its regular elytral rows of punctures and in the different colouration of the antennae.

## *Iviva antennata* **n. sp.**
(Fig. 61)

Holotype (sex not determined): Papua New Guinea, Morobe Prov., Aseki Oiwa, 1600–1700 m, 11.–12.III.1998, leg. A. Riedel (SMNS).

### Description

Black, antennae fulvous with segments 5–7 and upperside of the basal segment black, pygidium and tarsi dark fulvous.

Head with a few punctures, rather dull, frons about twice as wide as eye. Antennae reaching to base of elytra, the 5 apical segments moderately thickened, proportions of segments 7-5-5-5-5-5-6-6-6-6-9, preapical segments 1.4 times as long as wide. Prothorax 1.5 times as wide as long, strongly narrowed towards the apex, with a very weak setigerous tubercle on the anterior angle, lateral margins rounded, surface shining, finely and sparsely punctate. Scutellum triangular with rounded apex, as long as wide. Elytra as long as wide, humeral carina disappearing behind the middle, surface slightly shining, densely and almost uniformly punctate, without traces of rows. Pseudoepipleura distinct only in anterior half, wide, posteriorly narrowed, with a few punctures. Epipleura narrow, impunctate. Femora each with an acute tooth. Hind tarsal segment 1 barely longer than segment 2. Body length 3.0 mm, width 2.0 mm.

### Diagnosis

This new species differs from *I. coccinelloides* Gressitt, 1969 in a different colouration of the antennae, in having traces of rows among confused elytral punctures and in lacking a metallic luster.

## *Iviva diversipunctata* **n. sp.**

Holotype (sex not determined): New Guinea, Irian Jaya, Jayawijaya, N Bime, 2000–2070 m, 21.IX.1993, leg. A. Riedel (SMNS).

### Description

Black, antennae fulvous with upperside of the basal segment black, elytra with a slight bronze tint, tarsi piceous.

Head almost impunctate, frons very wide, about twice as wide as eye. Antennae reaching to base of elytra, the 5 apical segments thickened, proportions of segments 7-5-4-4-5-5-6-6-6-6-9, preapical segments 1.2 times as long as wide. Prothorax 1.8 times as wide as long, strongly narrowed towards the apex, with a setigerous tubercle on the anterior angle, lateral margins rounded, surface shining, finely and sparsely punctate. Scutellum triangular, slightly longer than wide, shining and impunctate. Elytra as long as wide, humeral carina distinct almost to apex, surface slightly shining, very densely punctate and with more large punctures partly arranged in short, nearly regular rows. Pseudoepipleura wide, posteriorly narrowed, with 1–2 rows of punctures. Epipleura narrow, impunctate. Femora each with an acute tooth. Hind tarsal segment 1 barely longer than segment 2. Body length 3.5 mm, width 2.4 mm.

### Diagnosis

This new species is similar to *Iviva antennata* n. sp., but its antennae are nearly fulvous, while the intermediate antennal segments are black in *I. antennata*.

Only a single species of this genus was known previously (Gressitt 1969). The species of *Iviva* can now be identified with the following key:

**1** Elytra with regular rows of punctures and wide, smooth interspaces (Fig. 60). – Antennae fulvous with blackish basal segment. Body length 2.8–3.3 mm. . . . . ***I. striata* n. sp.**
– Elytra confusedly punctate or with traces of rows among the dense punctures (Fig. 61). . . . . **2**
**2** Antennae pitchy brown with the segments 1–4 paler brown and segment 11 and apex of segment 10 pale flavous. Elytra finely confusedly punctate. – Upperside black with a golden bronzy tint. Body length 2.8 mm. . . . . ***I. coccinelloides*** Gressitt, 1969
– Colouration of antennae different. Elytra with traces of rows among confused punctures. . . . . **3**
**3** Antennae fulvous with segments 5–7 and upperside of basal segment black (Fig. 61). Upperside black. Elytra densely punctate, but with distinct and shining interspaces. Body length 3.0 mm. . . . . ***I. antennata* n. sp.**
– Antennae fulvous with black basal segment. Black, elytra with a slight bronze tint, very densely punctate, rather dull, with indistinct interspaces. Body length 3.5 mm. . . . . ***I. diversipunctata* n. sp.**

## Genus *Rhyparidella* Gressitt, 1969

## *Rhyparidella weisei* **n. sp.**
(Figs. 1, 62)

Holotype (♂): D. N. Guinea, Sattelberg, with J. Weise's label "*Nodostoma ingloria* Ws., sp. n.", but this name was never published (SMNS).

Etymology

The new species is dedicated to the memory of JULIUS WEISE (1844–1925), an eminent specialist on the family Chrysomelidae.

Description

Black, head dark red, labrum black with fulvous margins, basal antennal segments fulvous [the following segments missing in the holotype specimen].

Body elongate ovate, 1.7 times as long as wide (length excluding the head). Head strongly punctate and densely microsculptured, with shallow depression between frontoclypeus and vertex, frontoclypeus slightly narrowed towards its base, almost parallel-sided, with deep trapeziform incisure on anterior margin. Antennal segments 3 and 4 thin and long, subequal in length, segment 5 slightly shorter, segments 6–8 slightly widened, about 4 times as long as wide. Prothorax 1.7 times as wide as long and as wide as elytra at base, widest and clearly arcuate in its basal quarter, surface shining, strongly punctured laterally, much more finely punctured in the middle. Scutellum triangular. Elytra 1.2 times as long as wide, broadly rounded at apex, with distinct basal convexity and postbasal impression, rows of punctures distinct in the middle, but barely visible or absent on basal convexity and behind the middle, especially on apical slope. Fore tibiae distinctly widened towards the apex and flattened above. Aedeagus see Fig. 1. Body length 3.3 mm.

Diagnosis

This new species is similar to *R. sobrina* (Bryant, 1950), but differs in the red colouration and the strong punctuation of the head, and the fore femora which are dorsally flattened and distinctly widened.

*Rhyparidella rufocapitis* **n. sp.**
(Fig. 63)

Holotype (♀): New Guinea, Irian Jaya, Anggi, Tetaho Kosmena, 1400–1750 m, 26.–28.III.1993, leg. A. RIEDEL (SMNS).

Paratypes: Same data as holotype, 4 ♀♀ (SMNS).

Description

Black, head and narrow anterior margin of prothorax reddish fulvous, antennae fulvous with the 6 apical segments more or less darkened, legs fulvous.

Body ovate, 1.5 times as long as wide (length excluding the head). Head impunctate, densely microsculptured, without impression between frontoclypeus and vertex. Frontoclypeus nearly parallel-sided, arcuately emarginated anteriorly, vertex with shallow longitudinal groove in the middle. Antennae thin, almost reaching to the middle of the elytra, the 6 apical segments slightly thickened, about 4 times as long as wide. Prothorax 2.1 times as wide as long, nearly as wide as elytra at base, widest and clearly arcuate in basal quarter, surface dull, with dense microsculpture and sparse minute punctures, almost indistinct among microsculpture. Scutellum as wide as long, broadly rounded posteriorly. Elytra 1.25 times as long as wide, broadly rounded at apex, with distinct basal convexity and postbasal impression, elytral rows of punctures distinct only near scutellum, along suture, on postbasal impression and on the innerside of the humerus. Body length 3.7–4.1 mm.

Diagnosis

This new species is similar to *R. sobrina* (Bryant, 1950) and *R. arachi* (Gressitt, 1966), but differs in the red or fulvous head and legs, and in the densely microsculptured, nearly impunctate prothorax.

*Rhyparidella ovipennis* **n. sp.**
(Figs. 2, 64)

Holotype (♂): New Guinea, Irian Jaya, Jayawijaya, Ob. Sapi-Tal [= Upper Sapi Valley], 3400 m, 16.–17.IX.1993, leg. A. RIEDEL.

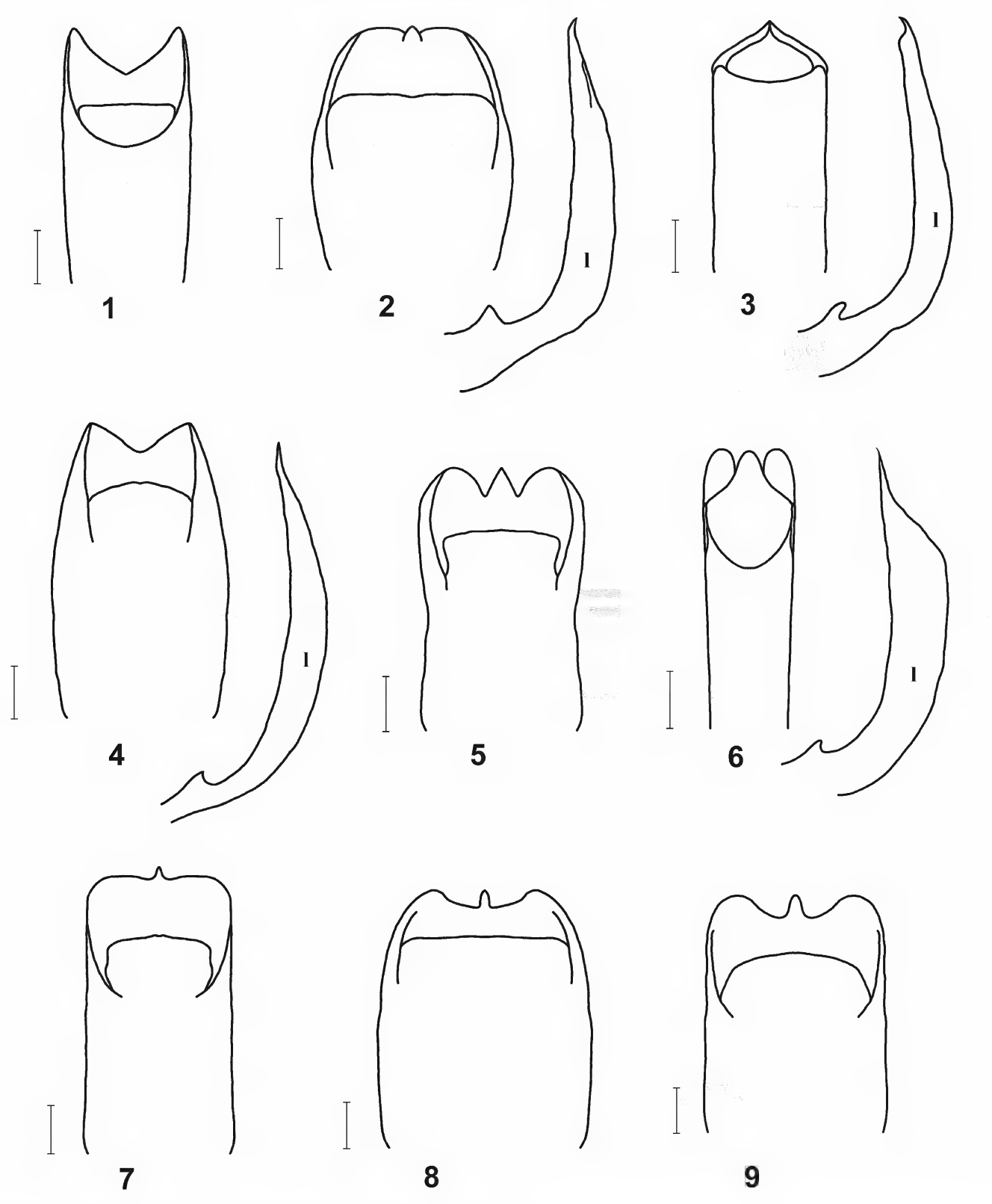
Paratypes: Same data as holotype, 1 ♂, 1 ♀ (SMNS).

Description

Dark castaneous, labrum fulvous, antennae with fulvous basal segments; each elytron piceous in the middle or sometimes piceous on almost the entire elytron except the margins, but poorly delimited from the castaneous colouration. Legs dark fulvous.

♂. Body elongate ovate, rather narrow, 1.8 times as long as wide (length excluding the head). Head impunctate, not microsculptured, without impression between frontoclypeus and vertex. Frontoclypeus slightly trapeziform, slightly emarginated anteriorly, vertex with a weak longitudinal groove in the middle. Antennae almost reaching to the middle of the elytra, the 6 apical segments moderately thickened, each about 2.5 times as long as wide. Prothorax 1.5 times as wide as long, evenly rounded laterally, widest in the middle, surface shining and impunctate. Elytra 1.35 times as long as wide, elongate ovate, widest in the middle and distinctly narrowed anteriorly and posteriorly, their anterior margin only slightly wider than prothorax at base; humeral tubercle very weak, basal convexity absent, punctures in rows deep and distinct to apex. Aedeagus (Fig. 2) truncate at apex with small protuberance in the middle. Body length 3.6 mm.

♀. Frontoclypeus divided from vertex by a shallow, but distinct impression, the latter more convex, with deep longitudinal groove in the middle. Body length 3.7 mm.




**Figs. 1–9.** *Rhyparidella* spp. and *Phainodina* spp., aedeagus, dorsal and lateral (= l) views. – **1**. *R. weisei* n. sp. **2**. *R. ovipennis* n. sp. **3**. *R. fulva* n. sp. **4**. *R. nigripennis* n. sp. **5**. *Rhyparidella suturalis* n. sp. **6**. *R. riedeli* n. sp. **7**. *Phainodina femorata* n. sp. **8**. *P. antennalis* n. sp. **9**. *P. riedeli* n. sp. – Scales: 0.1 mm.

Diagnosis

This species is obviously similar to *R. corpulenta* Gressitt, 1969 (which was described on the basis of females only), but differs in the impunctate prothorax, the barely developed humeral tubercle, the absence of a basal convexity on the elytra, and the larger body.

### *Rhyparidella fulva* **n. sp.**
(Figs. 3, 65)

Holotype (♂): New Guinea, Irian Jaya, Anggi, Tetaho Kosmena, 1400–1750 m, 26.–28.III.1993, leg. A. Riedel (SMNS).

Description

Fulvous, the 6 apical antennal segments and breast piceous.

Body ovate, 1.7 times as long as wide (length excluding the head). Head impunctate, frontoclypeus not divided from frons, a little longer than wide, slightly narrowed posteriorly with its sides slightly concave and its anterior margin incised in the middle. Vertex with trace of longitudinal groove. Antennae reaching to the middle of the elytra, very thin, apical segments nearly not widened, each segment about 4–5 times as long as wide. Prothorax 1.8 times as wide as long and as wide as elytra at base, rounded laterally and widest at its basal quarter, surface microsculptured, with sparse, minute punctures. Scutellum broadly rounded at apex. Elytra 1.25 times as long as wide, parallel-sided with broadly rounded apex, basal convexity and postbasal impression barely developed, elytral rows of punctures not deep, except a few in the postbasal impression, punctures almost disappearing on basal convexity and apical slope. Aedeagus parallel-sided with short triangular apex ending in an acute tip (Fig. 3). Body length 3.0 mm.

Diagnosis

This new species differs from all other known species of the genus in the unusual shape of the aedeagus and the finely punctured prothorax.

### *Rhyparidella nigripennis* **n. sp.**
(Figs. 4, 66)

Holotype (♂): New Guinea, Irian Jaya, Jayawijaya, Elpomek, 1800–2300 m, 5.IX.1992, leg. A. Riedel (SMNS).

Description

Red fulvous, the 6 apical antennal segments, elytra, breast and tarsi black, scutellum and epipleura piceous.

Body elongate ovate, 1.6 times as long as wide (length excluding the head). Head distinctly punctate on frontoclypeus and the middle part of the vertex, frontoclypeus slightly emarginated laterally, not narrowed posteriorly, arcuately emarginated anteriorly, not divided from vertex, which has a shallow longitudinal impression in the middle. Antennae reaching to the anterior third of the elytra, the 6 apical segments slightly widened, each about 2.5 times as long as wide. Prothorax 1.65 times as wide as long, evenly rounded laterally, widest behind the middle, very finely and sparsely punctate, interspaces about 5 times as wide as punctures. Elytra 1.2 times as long as wide, parallel-sided, broadly rounded at apex, with weak basal convexity and postbasal impression, punctures of elytral rows relatively small and shallow, especially on the apex, interspaces flat, about 3 times as wide as diameter of punctures, very finely microsculptured. Apex of Aedeagus triangularly incised, forming an angle of about 120° (Fig. 4). Body length 4.1 mm.

Diagnosis

This new species is similar to *R. bicolor* Gressitt, 1969, which differs in metallic elytra and the deeper and narrower apical incisure of the aedeagus, which forms an angle of about 75°.

### *Rhyparidella suturalis* **n. sp.**
(Figs. 5, 67)

Holotype (♂): New Guinea, Irian Jaya, Jayawijaya, Kono, 2000 m, 19.IX.1992, leg. A. Riedel (SMNS).

Description

Fulvous, the 6 apical antennal segments and prothorax black, elytra with narrow piceous sutural stripe which is triangularly widened before scutellum, breast piceous, tarsi darkened.

Body elongate ovate, 1.65 times as long as wide (length excluding the head). Head finely microsculptured, distinctly punctate on frontoclypeus, impunctate on vertex. Frontoclypeus not divided from vertex, slightly concave on its anterior margin, vertex with trace of longitudinal groove. Antennae almost reaching to the middle of elytra, the 6 apical segments nearly not widened, each about 3 times as long as wide. Prothorax 1.6 times as wide as long, rounded laterally, widest and distinctly angulated in the middle, surface microsculptured, with moderately strong punctures, but nearly impunctate along anterior and posterior margins. Scutellum triangular, microsculptured. Elytra 1.15 times as long as wide, almost parallel-sided, broadly rounded at apex, with distinct basal convexity and postbasal impression, elytral rows with rather deep punctures in their basal half, including the basal convexity, but nearly impunctate in their apical half, interspaces wide,

flat, and shining. Inner part of splittered claws very short. Aedeagus see Fig. 5. Body length 3.2 mm.

### Diagnosis

Differs from all known species of this genus in the colouration of the upperside and the prothorax, which is angulated laterally.

## *Rhyparidella riedeli* **n. sp.**
(Figs. 6, 44, 68)

Holotype (♂): New Guinea, Irian Jaya, Anggi, Tetaho Kosmena, 1400–1750 m, 26.–28.III.1993, leg. A. Riedel (SMNS).

Paratypes: Same data as holotype, 2 ♂♂, 1 ♀ (SMNS). – New Guinea, Irian Jaya, Manokwari, Gunung Meja, 200 m, 19.IV.1993, leg. A. Riedel, 1 ♂ (SMNS).

### Etymology

This new species has been named in honour of its collector, Dr. Alexander Riedel (Karlsruhe).

### Description

Fulvous, apical antennal segments more or less darkened, breast dark fulvous, elytra often with more or less distinct but poorly delimited piceous patch behind the middle.

Body elongate ovate, 1.7 times as long as wide (length excluding the head). Head impunctate, frontoclypeus strongly narrowed posteriorly, with its sides slightly concave and anterior margin incised. Ocular groove sharp, reaching obliquely forward, but divided in the middle by narrow convex space (Fig. 44). Vertex not grooved in the middle. Antennae reaching to the middle of the elytra, the 5 apical segments slightly thickened, each about twice as long as wide. Prothorax 1.4 times as wide as long, a little narrower than elytra at base, evenly rounded laterally, widest in the middle, anterior margin with narrow collar interrupted in the middle, surface convex, shining and impunctate. Scutellum rounded at apex. Elytra 1.1 times as long as wide, parallel-sided and broadly rounded at apex, surface with distinct basal convexity and postbasal impressions, punctures in rows rather small, especially on basal convexity and behind the middle, interspaces wide, flat and shining. Aedeagus (Fig. 6) long and thin, its apex slightly tridentate. Body length 2.9–3.0 mm in ♂, 3.2 mm in ♀.

### Diagnosis

This new species differs from all other known species of the genus in the structure of the head, especially the frontoclypeus which is almost divided from the vertex by deep ocular furrows. After a revision of all *Rhyparida*-like genera, a separate genus might be proposed for this species.

## Genus *Phainodina* Gressitt, 1969

## *Phainodina femorata* **n. sp.**
(Figs. 7, 71)

Holotype (♂): Papua New Guinea, Sandaun Prov., Mianmin, 700–1100 m, 20.V.1998, leg. A. Riedel (SMNS).

Paratypes: New Guinea, Irian Jaya, Jayawijaya, Borme, 1000–1300 m, 13.–18.VIII.1992, leg. A. Riedel, 1 ♂ (SMNS). – New Guinea, Irian Jaya, Jayawijaya, Emdoman, 800–1200 m, 14.–15.IX.1992, leg. A. Riedel, 1 ♂ (SMNS).

### Description

Black; labrum, 2 spots on vertex, 3 basal antennal segments and inner half of hind femora fulvous.

Body elongate ovate, 1.5 times as long as wide (length excluding the head). Head smooth and impunctate, frontoclypeus wider than long, separated from vertex by a slight transverse depression, the latter with very weak median groove in the holotype, but evenly convex in the paratypes. Antennae almost reaching to the middle of the elytra, segments 1 and 3 thickened, the following segments thin, 4 and 5 longer than 3, 6–11 of the same length as segment 5, about 4 times as long as wide. Prothorax 1.7 times as wide as long, broadly rounded laterally, widest in the middle, surface strongly convex, shining and impunctate. Scutellum broadly rounded at apex. Elytra nearly as long as wide, broadly rounded at apex, with distinct basal convexity and postbasal impression, punctures in rows not deep, much smaller on apical slope and almost disappearing on basal convexity, interspaces of rows flat, about 3–4 times as wide as punctures. All femora distinctly toothed on underside. Aedeagus see Fig. 7. Body length 3.4–3.6 mm.

### Diagnosis

This new species is morphologically and in the shape of the aedeagus identical with *P. stygica* Gressitt, 1969, which, however, has the two apical antennal segments fulvous and the hind femora entirely black (the colouration, especially of the antennal segments, is apperently a very constant character in the genus *Phainodina*).

## *Phainodina antennalis* **n. sp.**
(Figs. 8, 69)

Holotype (♂): New Guinea, Irian Jaya, Testega, 1100–1300 m, 30.III.–2.IV.1993, leg. A. Riedel (SMNS).

Paratypes: Same data as holotype, 3 ♂♂, 5 ♀♀ (SMNS).

### Description

Black, labrum fulvous, antennae with the 4 basal seg-

ments fulvous and segment 10 almost white, prothorax red fulvous, elytra with a slight metallic blue or bronze gloss, pygidium and apical abdominal sternites fulvous, legs piceous and partly dark red in the ♀, fulvous in the ♂.

Body short ovate, 1.3 times as long as wide (length excluding the head). Head smooth and impunctate, frontoclypeus wider than long, trapeziform, arcuately emarginated apically, not distinctly divided from the vertex, which has no median groove. Antennae reaching to the middle of the elytra, segments 1 and 2 rather thick, 3–5 very slender, 4 and 5 longer than 3, 6–11 subequal in length, moderately thickened, 8 and 9 about twice as long as wide. Prothorax twice as wide as long, broadly rounded laterally, widest slightly behind the middle, surface even and strongly convex, shining, impunctate. Scutellum broadly rounded behind. Elytra as long as wide, rounded apically, with very weak, almost indistinct basal convexity and postbasal impression, punctures of elytral rows deep, weaker on the apical slope, interspaces flat or slightly convex, about 3 times as wide as punctures. Femoral tooth well developed, but not large. Aedeagus see Fig. 8. Body length 3.4–3.7 mm in ♂, 3.7–4.3 mm in ♀.

### Diagnosis

This new species is similar to *P. stygica* Gressitt, 1969, but differs in the colouration of antennae, prothorax and legs, and in the absence of the elytral basal convexity.

### *Phainodina riedeli* **n. sp.**
(Figs. 9, 70)

Holotype (♂): New Guinea, Irian Jaya, Meydoudga, 1200–1400 m, 5.IV.1993, leg. A. Riedel (SMNS).

Paratypes: Same data as holotype, 1 ♂ (SMNS). – New Guinea, Irian Jaya, Testega, 1100–1200 m, 11.IV.1993, leg. A. Riedel, 4 ♂♂ (SMNS).

### Etymology

This new species has been named in honour of its collector, Dr. Alexander Riedel (Karlsruhe).

### Description

Fulvous, clypeus and occiput usually more or less darkened, the 6 apical antennal segments black, elytra metallic bronze or greenish bronze.

Body short ovate, 1.3 times as long as wide (length excluding the head). Head smooth and impunctate, frontoclypeus wider than long, trapeziform, arcuately emarginated in the middle of anterior border, sharply divided from vertex, which has no median groove. Antennae reaching to the middle of the elytra, proportions of the segments as in *P. antennalis* n. sp. Prothorax twice as wide as long, broadly rounded laterally, widest just before the middle, surface strongly convex, shining and impunctate. Scutellum broadly rounded at apex. Elytra as long as wide, rounded apically, sculpture of surface nearly the same as in *P. antennalis* n. sp. Femoral tooth well developed, but not large. Aedeagus see Fig. 9. Body length 3.8–4.3 mm.

### Diagnosis

This new species is very similar to *P. antennalis* n. sp., but differs in the structure of the vertex (sharply divided from the frontoclypeus in *P. riedeli*), the different colouration (all apical antennal segments black), and the different shape of the aedeagus (parallel-sided with larger apical lobes).

## Genus *Stethotes* Baly, 1867

### General

36 species of the genus *Stethotes* were previously known from New Guinea, 18 of which were described by Gressitt (1966), who presented figures of the aedeagi for nearly all of his species. The species of this genus are clearly distinguished by their colouration, the shape of the elytra, the sculpture of the upperside, and especially by the structure of the aedeagi. It is a problem that the aedeagi are unknown for the species [except *S. elegantula* (Baly, 1864)], which were described previous to Gressitt's revision.

On the basis of numerous specimens examined during the present study in the SMNS collection (about 4000 specimens), 31 new species are described below.

### Group A

Species with broadly rounded elytral apices and confused punctures at the elytral base or in the scutellar area. Two species were previously known, *S. bicolor* Gressitt, 1966 and *S. semicastanea* Gressitt, 1966.

### *Stethotes carinata* **n. sp.**
(Fig. 10)

Holotype (♂): New Guinea, Irian Jaya, Jayawijaya, Bommela, 1750–2100 m, 1.IX.1992, leg. A. Riedel (SMNS).

### Description

Head and prothorax dark aeneous, antennae black with the 5 basal segments fulvous, scutellum black, elytra reddish fulvous with large black triangle in the scutellar area, underside and legs reddish fulvous, but femora more or less darkened, at least with black apices.

Head finely and sparsely punctate, vertex convex, without central groove, but with deep groove above the

eye. Antennae reaching to the anterior third of the elytra, segments 2–10 subequal in length, preapical segments about 3 times as long as wide. Prothorax 1.5 times as wide as long, widest before its base, with lateral margins rounded, surface shining, densely and in part strigosely punctate, with interspaces not wider than punctures. Scutellum triangular with rounded apex. Elytra 1.65 times as long as wide, subparallel with broadly rounded apices, surface with 11 regular rows of punctures, but with the punctures in the scutellar area confused and crowded, interspaces as wide as diameter of punctures, strongly convex, more or less costate, especially at the base and in the middle, humeral tubercle high. Femora each with a small tooth. Aedeagus (Fig. 10) parallel-sided, wide, apex truncate with small central protuberance. Body length 2.2 mm.

Diagnosis

This new species is similar to *S. semicastanea* Gressitt, 1966, but is smaller, with costate elytral interspaces, and a distinctly different shape of the aedeagus.

*Stethotes riedeli* **n. sp.**
(Figs. 11, 72)

Holotype (♂): Papua New Guinea, Morobe Prov., Wau, Mt. Kaindi, 1850–2150 m, 8.X.1992, leg. A. Riedel (SMNS).

Paratypes: Same data as holotype, 1 ♂ (SMNS). – Papua New Guinea, Morobe Prov., ridge between Aseki and Menyamya, 2000–2500 m, 12.IV.1998, leg. A. Riedel, 1 ♀ (SMNS).

Etymology

The name of this species is dedicated to its collector, Dr. Alexander Riedel (Karlsruhe).

Description

Head red fulvous, antennae black or piceous with fulvous basal segments, prothorax black or piceous, elytra dark reddish fulvous with the basal quarter piceous or at least much darker than the rest of surface, legs dark reddish fulvous with the segment 3 flavous.

Frons and clypeus finely punctate and microsculptured, vertex convex, shining, with a weak central impression, ocular grooves deep. Antennae reaching to the anterior quarter of the elytra, segments 2–6 and 8–10 subequal in length, 7 and 11 a little longer. Prothorax 1.3 times as wide as long, widest at its base, strongly narrowed anteriorly, slightly rounded laterally, surface dull, strongly and very densely, partly strigosely punctate, interspaces very narrow, much smaller than punctures. Scutellum triangular with rounded apex, microsculptured. Elytra 1.3 times as long as wide, widest at their shoulders, narrowed posteriorly, with broadly rounded apices, surface shining, confusedly punctate, partly with regular rows of punctures on the outer part, punctures moderately dense and deep, interspaces much wider than punctures, flat. Femora with a small acute tooth, very small on fore femora, hind femora strongly clavate. Segment 1 of fore and mid tarsi thickened. Aedeagus (Fig. 11) wide and flat, apex trilobed. Body length 2.6 mm in ♂, 2.8 mm in ♀.

Diagnosis

This new species is similar to *S. bicolor* Gressitt, 1966, but differs in the colouration, the strongly confused elytral punctures and the shape of the aedeagus.

*Stethotes basipennis* **n. sp.**
(Fig. 12)

Holotype (♂): New Guinea, Irian Jaya, Jayawijaya, Yalmabi, 1200–1400 m, 8.IX.1996, leg. A. Riedel (SMNS).

Paratype: Same data as holotype, 1 ♂ (LM).

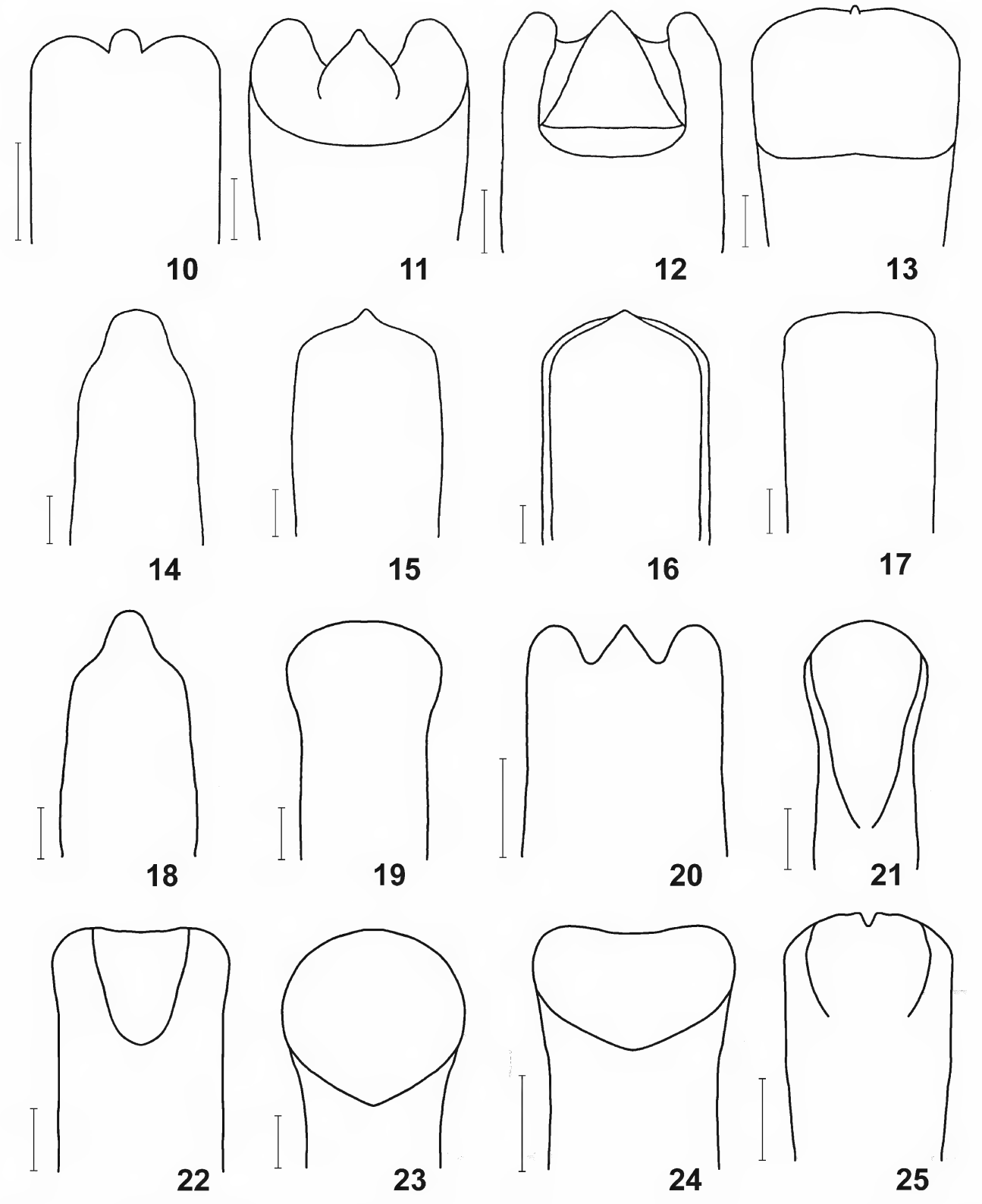
Description

Black, the 4 basal antennal segments and the third tarsal segment fulvous, elytra dark red with the basal quarter black, labrum reddish fulvous.

Head with fine and moderately dense punctures, shining, vertex with the trace of a central impression, ocular grooves narrow and shallow, anterior margin of clypeus almost straight. Antennae reaching to the anterior third of the elytra, segments 2–10 subequal in length, preapical segments about 3 times as long as wide. Prothorax 1.3 times as wide as long, widest at its base, slightly narrowed anteriorly, with lateral margins almost straight, surface shining, with strong and dense, more or less elongate punctures and narrow interspaces, most of which are smaller than punctures. Scutellum triangular with rounded apex, shining. Elytra 1.3 times as long as wide, widest near base and narrowed posteriorly, with apices broadly rounded, surface shining, with 11 regular rows of punctures, confused in scutellar area, interspaces not wide, mostly narrower than punctures. Femora each with a very small but acute tooth, hind femora strongly clavate. Segment 1 of fore and mid tarsi widened in the ♂. Aedeagus (Fig. 12) deeply concave on underside, with trilobed apex, lateral lobes curved inward. Body length 2.6–3.1 mm.

Diagnosis

This new species is morphologically very similar to *S. semicastanea* Gressitt, 1966, but has a different colouration of the elytra, and a quite different shape of the aedeagus, which resembles *S. riedeli* n. sp.




**Figs. 10–25.** *Stethotes* spp., aedeagus, ventral views. – **10**. *S. carinata* n. sp. **11**. *S. riedeli* n. sp. **12**. *S. basipennis* n. sp. **13**. *S. obscura* n. sp. **14**. *S. schawalleri* n. sp. **15**. *S. papuana* n. sp. **16**. *S. armata* n. sp. **17**. *S. basifasciata* n. sp. **18**. *S. bryanti* n. sp. **19**. *S. rufula* n. sp. **20**. *S. tristis* n. sp. **21**. *S. suturalis* Bryant. **22**. *S. fulvicornis* n. sp. **23**. *S. rubripes* n. sp. **24**. *S. aenea* n. sp. **25**. *S. costipennis* n. sp. – Scales: 0.1 mm.

*Stethotes obscura* **n. sp.**
(Fig. 13)

Holotype (♂): New Guinea, Irian Jaya, Jayawijaya, Taramlu, 1500–1700 m, 6.IX.1993, leg. A. Riedel (SMNS).

Description

Piceous to black, labrum, the 4 basal antennal segments and the third tarsal segment fulvous.

Head with moderately dense punctures, vertex flat, without central groove, ocular grooves indistinct. Antennae reaching to the anterior third of the elytra, segment 3 about 1.5 times as long as segment 2, segments 3–5 subequal in length, the following segments a little longer, slightly thickened, about 3 times as long as wide. Prothorax 1.45 times as wide as long, widest at its base and strongly narrowed anteriorly, strongly convex, lateral margins not visible from above, surface slightly shining, with strong and dense transverse punctures and narrow microsculptured interspaces, which are much smaller than punctures. Scutellum triangular with rounded apex, microsculptured. Elytra 1.4 times as long as wide, narrowed posteriorly, convex, with rounded apices, surface shining, with 11 not quite regular rows, confusedly punctate in scutellar area and along suture, interspaces flat and much wider than punctures. Femora with a small acute tooth (hind femora absent). Segment 1 of fore and mid tarsi not widened. Aedeagus (Fig. 13) widened towards the widely truncate apex which has a small acute tip in the middle, underside deeply concave, with transverse ridge in apical third. Body length 2.9 mm.

Diagnosis

This new species is similar to *S. bicolor* Gressitt, 1966, but differs in the unicoloured dark elytra and the shape of the aedeagus.

Group B

This group includes species with subacute apices of elytra and confused punctures at the elytral base or in the scutellar area. Just a single species was previously known for this group, *S. loriae* Jacoby, 1905 (aedeagus of that species unknown).

*Stethotes dentata* **n. sp.**

Holotype (♀): Papua New Guinea, Morobe Prov., Aseki, 1000–1300 m, 13.X.1992, leg. A. Riedel (SMNS).

Description

Piceous to dark piceous, basal antennal segments, labrum and tarsi fulvous, scutellum reddish.

Head dull, finely and rather densely punctate, vertex without longitudinal impression, ocular grooves wide and shallow. Antennae reaching to the anterior quarter of the elytra, segments 3–10 subequal in length, preapical segments about twice as long as wide. Prothorax 1.5 times as wide as long, moderately narrowed anteriorly, lateral margins almost straight, surface dull, strongly and very densely punctate, interspaces smaller than punctures, partly costate. Scutellum triangular with rounded apex, microsculptured. Elytra 1.4 times as long as wide, widest at shoulders and strongly narrowed posteriorly, with narrow subacute apices, surface dull, strongly, densely and confusedly punctate, with a few regular rows near the lateral margin, interspaces smaller than punctures, microsculptured. Femora each with a large triangular tooth, hind femora strongly clavate. Body length 4.0 mm.

Diagnosis

This new species is similar to *S. loriae* Jacoby, 1905, but much larger, with elytral punctures strongly confused and the femora with a large tooth.

*Stethotes schawalleri* **n. sp.**
(Figs. 14, 73)

Holotype (♂): New Guinea, Irian Jaya, Anggi, Tetaho, Iranmeba, 1500–1700 m, 25.III.1993, leg. A. Riedel (SMNS).

Paratypes: Same data as holotype, 1 ♀ (SMNS). – New Guinea, Irian Jaya, Jayawijaya, Jiwika, trail to Wandanku, 1900–2150 m, 28.–29.IX.1996, leg. A. Riedel, 1 ♀ (SMNS).

Etymology

The name of this new species is dedicated to my friend, the coleopterologist Dr. Wolfgang Schawaller (Stuttgart).

Description

Head piceous with reddish labrum, antennae black or piceous with fulvous basal segments, prothorax black or piceous, elytra dark red or red orange with basal fifth piceous or black, apical quarter of elytra black in the paratype from Anggi, underside and legs fulvous, tarsal segment 3 or all tarsi fulvous.

Head finely and sparsely punctate, densely microsculptured, ocular grooves narrow. Antennae reaching to the anterior quarter of the elytra, segments 2–10 subequal in length, preapical segments about 2.0–2.5 times as long as wide. Prothorax 1.3 times as wide as long, widest at its base, with the lateral margins barely rounded, surface dull, densely punctate, punctures more or less transverse, interspaces smaller than punctures, finely microsculptured. Scutellum slightly transverse, its apex widely truncate. Elytra 1.2 times as long as wide, widest near base, strongly narrowed posteriorly, with narrow, almost acute apices, surface shining, with subregular rows of strong

punctures, which are confused basally. Femora each with a small acute tooth, hind femora strongly clavate. Segment 1 of fore and mid tarsi widened in the ♂. Aedeagus (Fig. 14) with wide apical protuberance. Body length 2.7 mm in ♂, 2.9–3.4 mm in ♀.

### Diagnosis

This new species is similar to *S. loriae* Jacoby, 1905, which differs in unicoloured pitch black elytra with wide apices, and a smaller size (2.5 mm).

### Group C

This group includes species with acute apices of the elytra and 17–18 elytral rows of punctures. Two species of this group were previously known, *S. punctissima* Gressitt, 1966 and *S. similis* Gressitt, 1966.

## *Stethotes aethiops* **n. sp.**
(Fig. 37)

Holotype (♂): Papua New Guinea, Morobe Prov., Wau, Mt. Kaindi, 1550 m, 7.X.1992, leg. A. Riedel (SMNS).

### Description

Black, labrum fulvous, maxillar palpi fulvous with black apical segment, antennae piceous with the 2 basal segments fulvous, tarsi dirty fulvous.

Body narrow, elongate, twice as long as wide. Head microsculptured, sparsely punctate, with deep supraocular grooves which are prolonged anteriorly and almost connected on the frons. Antennae thin, segments 2–10 subequal in length, preapical segments nearly not thickened, about 4 times as long as wide. Prothorax 1.3 times as wide as long, conical, widest at its base, surface shining, with moderately dense and fine punctures and interspaces mostly wider than diameter of punctures. Scutellum small, almost subquadrate with rounded apex, microsculptured. Elytra 1.45 times as long as wide, widest in the humeral area, strongly narrowed and produced posteriorly, surface with about 18 rows of very closely set punctures, interspaces shining, about as wide as diameter of punctures. Femora each with a large acute tooth on underside, especially distinct on fore femora. Segment 1 of fore and mid tarsi widened, triangular, as long as wide. Aedeagus (Fig. 37) with a shallow impression on its underside before the apex, divided by a longitudinal ridge. Body length 3.4 mm.

### Diagnosis

This new species differs from the two previously known species of this group in the sculpture of the head, the much finer, not subreticulate punctures of the prothorax, the large tooth on the fore femora and the shape of the aedeagus.

### Group D

This group includes species with 11 regular or subregular rows of punctures, and with acute elytral apices; elytra without postbasal impression.

### Subgroup D 1

Elytra bicoloured or entirely reddish.

### Subgroup D 1.1

Elytra bicoloured with the basal part always dark. Two species of this subgroup were previously known, *S. rubrofasciata* Bryant, 1950, and *S. latifasciata* Gressitt, 1966.

## *Stethotes papuana* **n. sp.**
(Figs. 15, 75)

Holotype (♂): Papua New Guinea, Morobe Prov., ca. 10 km S Garaina, Saureri, 1400–1700 m, 20.III.1998, leg. A. Riedel.

### Description

Black, basal antennal segments, labrum and apical tarsal segments fulvous to reddish fulvous, elytra with wide red band in the middle, situated nearer to the basal margin than to the apex.

Head shining, finely and sparsely punctate, especially on the vertex, which bears a distinct longitudinal impression, ocular grooves deep and sharp. Antennae reaching to the anterior quarter of the elytra, segments 2–6 subequal in length, the following segments a little longer, about 3 times as long as wide. Prothorax 1.2 times as wide as long, widest before its base, strongly narrowed anteriorly, slightly rounded laterally, surface convex, with fine and moderately dense punctures, interspaces flat and mostly wider than punctures. Scutellum as long as wide, with broadly rounded apex, finely microsculptured. Elytra 1.35 times as long as wide, widest in the humeral area and strongly narrowed posteriorly, with acute apices and a weak humeral tubercle, surface shining, without basal convexity, with 11 regular rows of relatively small punctures, interspaces wide and flat. Femora each with a small acute tooth, hind femora clavate, but the narrow basal part rather short. Segment 1 of fore and mid tarsi moderately widened. Aedeagus see Fig. 15. Body length 3.0 mm.

### Diagnosis

This new species is very similar to *S. rubrofasciata* Bryant, 1950, but differs in a smaller body, much more

elongate elytra and the apex of the aedeagus broadly rounded, with a short apical tip.

### *Stethotes armata* **n. sp.**
(Figs. 16, 74)

Holotype (♂): New Guinea, Irian Jaya, Jayawijaya, Diuremna, 1900–2100 m, 9.–11.IX.1992, leg. A. Riedel (SMNS).

#### Description

Black, basal antennal segments fulvous; elytra dark red, with the basal quarter more prolonged along the suture and a narrow stripe on the apical quarter of the lateral margin including the apex black; abdomen red.

Head dull, clypeus punctate, vertex strongly convex, very densely longitudinally strigose, ocular grooves wide, deep, prolonged anteriorly and almost connected on the frons. Antennae reaching to the anterior quarter of the elytra, segments 2–10 subequal in length, preapical segments about twice as long as wide. Prothorax 1.3 times as wide as long, widest at its base, strongly narrowed anteriorly, very strongly convex, with almost straight lateral margins, which are not visible from above, surface with moderately strong and dense punctures, which are smaller than the punctures on the elytra, interspaces flat, mostly wider than punctures, finely microsculptured. Scutellum triangular with rounded apex, impunctate. Elytra 1.25 times as long as wide, widest at shoulders and strongly narrowed posteriorly, with subacute apices, surface without basal convexity, with 11 rows of regular and partly subregular rows of punctures; punctures in rows small, interspaces wide, flat, shining. Femora each with a large acute tooth, hind femora strongly clavate. Segment 1 of fore and mid tarsi widened. Aedeagus (Fig. 16) wide, parallel-sided, with truncate apex, underside slightly concave. Body length 3.5 mm.

#### Diagnosis

This new species is similar to *S. latifasciata* Gressitt, 1966, but differs in its larger size, the different colouration of head, antennae and elytra, the absence of a metallic luster, the strongly strigose vertex, and the shape of the apex of the aedeagus.

### *Stethotes basifasciata* **n. sp.**
(Fig. 17)

Holotype (♂): New Guinea, Irian Jaya, Jayawijaya, Taramlu, 1500–1700 m, 6.IX.1993, leg. A. Riedel (SMNS).

#### Description

Black, labrum and palpi fulvous, antennae black with the basal segments fulvous, elytra rufous with the basal third dark piceous, legs dark piceous.

Body elongate ovate. Head densely microsculptured with large flat punctures, supraocular grooves wide and deep, vertex with thin impressed line in the middle. Antennae reaching basal quarter of elytra, proportions of segments 8-5-5-8-6-5-7-7-8-9-9, preapical segments twice as long as wide, segment 7 thicker, 1.5 times as long as wide. Prothorax 1.2 times as wide as long, widest at its base, conical with almost straight hind margins, surface with large dense punctures, interspaces flat, shining, mostly narrower than diameter of punctures. Scutellum subquadrate with rounded apex, microsculptured. Elytra 1.4 times as long as wide, widest in the humeral area, almost parallel in the anterior half, narrowed behind the middle, with acute apices, surface with 11 regular rows of punctures, as wide as or a little wider than punctures. Femora each with a small acute tooth on underside. Segment 1 of fore and mid tarsi distinctly widened in the ♂, triangular, as long as wide. Aedeagus (Fig. 17) with truncate apex, concave on underside. Body length 3.5 mm.

#### Diagnosis

This new species differs from the previously known species of this subgroup in the absence of black colour on the posterior part of the elytra, from *S. latifasciata* also in the different shape of the aedeagus, and from *S. rubrofasciata* also in the absence of a postbasal impression on the elytra.

### *Stethotes bryanti* **n. sp.**
(Fig. 18)

Holotype (♂): New Guinea, Irian Jaya, Jayawijaya, Jiwika, trail to Wandanku, 1900–2150 m, 28.–29.IX.1996, leg. A. Riedel (SMNS).

Paratypes: Same data as holotype, 2 ♀♀ (SMNS, LM).

#### Etymology

The name of this new species is dedicated to the memory of Dr. Gilbert Ernest Bryant (1878–1965), who also investigated chrysomelid beetles of this group from New Guinea (Bryant 1950).

#### Description

Piceous to dark piceous, labrum rufous, antennae black with the 3 basal segments fulvous, elytra rufous with the basal one-fifth castaneous to piceous, abdomen and legs rufous.

Body elongate ovate. Head microsculptured, finely and sparsely punctate, vertex in one paratype strongly and in part strigosely punctate, supraocular groove wide and deep. Antennae reaching to the anterior third of the elytra, segments 2–10 subequal in length, preapical segments

about 1.6 times as long as wide. Prothorax 1.3 times as wide as long, widest at its base, conical, surface with rather strong and moderately dense punctures, interspaces smooth, as wide as punctures. Scutellum triangular with rounded apex, microsculptured. Elytra 1.3 times as long as wide, in anterior half almost parallel-sided, narrowed behind the middle, with acute apices, surface with 11 regular rows of strong punctures, which are larger than the punctures on the prothorax, interspaces shining, flat, twice as wide as diameter of punctures. Femora each with a small acute tooth. Segment 1 of fore and mid tarsi widened in the ♂, as long as wide. Aedeagus (Fig. 18) with a wide apical protuberance, without any impression on the underside. Body length 2.8–3.0 mm.

Diagnosis

*Stethotes bryanti* n. sp. is similar to the preceding species. It differs in colouration details, in its smaller size, and especially in the shape of its aedeagus. The same type of aedeagus is known only for *S. cryptorrhynchodes* Gressitt, 1966 and *S. leleta* Gressitt, 1966, which, however, have a distinct postbasal impression on the elytra and the upperside unicoloured.

Subgroup D 1.2

Body rufous. A single species was previously known, *S. apicalis* Gressitt, 1966.

*Stethotes rufula* **n. sp.**
(Fig. 19)

Holotype (♂): New Guinea, Irian Jaya, Jayawi-Galbok b. Nalca, 1700–1800 m, 3.X.1993, leg. A. Riedel (SMNS).

Description

Rufous,the 3 basal antennal segments fulvous.

Body elongate ovate. Head microsculptured, with a few indistinct punctures on the clypeus, supraocular grooves deep and sharp. Antennae reaching to the anterior third of the elytra, segments 2–10 subequal in length, preapical segments about twice as long as wide. Prothorax 1.3 times as wide as long, widest at its base, surface with fine and moderately dense punctures, especially in the middle, interspaces distinctly microsculptured, flat, in the middle wider than punctures. Scutellum triangular with broadly rounded apex, microsculptured. Elytra 1.5 times as long as wide, widest at anterior third, strongly narrowed posteriorly, with acute apices, surface with a weak humeral tubercle and 11 regular rows of rather strong punctures, which are larger than those on the prothorax, interspaces shining, flat, about twice as wide as diameter of punctures. Femora each with a small acute tooth on underside. Segment 1 of fore and mid tarsi widened in the ♂, triangular, as long as wide. Aedeagus (Fig. 19) with truncate apex and longitudinal impression in the middle part of the underside. Body length 3.2 mm.

Diagnosis

This new species differs from *S. apicalis* Gressitt, 1966 in its punctured prothorax, the shape of the elytra, and especially the aedeagus.

Subgroup D 2

Upperside unicoloured, bright metallic. A single species was previously known, *S. virida* Gressitt, 1966.

*Stethotes viridissima* **n. sp.**
(Fig. 77)

Holotype (♀): Papua New Guinea, Vanimo, Denake-Range, 500 m, 28.–29.X.1992, leg. A. Riedel (SMNS) [antennae and legs partly broken].

Description

Bright metallic green, labrum fulvous, maxillar palpi fulvous with the apical segment black; antennae black with the 4 basal segments fulvous, segment 1 green on the upperside.

Head finely and sparsely punctate, denser near the eyes, vertex strongly convex, divided from frons by a deep shallow impression, with central groove and deep grooves along the eyes. Antennae reaching to base of elytra, segments 3–10 subequal in length, segment 2 shorter, segment 11 a little longer, preapical segments more than 3 times as long as wide. Prothorax 1.3 times as wide as long, widest at its base, with lateral margins almost straight, anterior angles produced and bluntly rounded, surface shining, very finely and sparsely punctate, punctures smaller than on the elytra, all interspaces much larger than diameter of punctures. Scutellum elongate, triangular, with rounded apex. Elytra 1.5 times as long as wide, widest near base and distinctly narrowed posteriorly, apices rather narrow, subtriangular, surface with 11 regular rows of punctures, interspaces wide and flat, moderately convex only laterally, humeral tubercle high. Femora each with a strong tooth. Body length 6.8 mm.

Diagnosis

This new species is apparently the largest in the genus. *S. nigrocoerulea* (Baly, 1864) from Ceram is similar, but has broadly rounded elytral apices, a purplish to greenish blue upperside and a smaller size (6 mm).

Subgroup D 3

Upperside black without metallic tint. A single species was previously known, *S. atra* Baly, 1867.

*Stethotes tristis* **n. sp.**
(Fig. 20)

Holotype (♂): New Guinea, Irian Jaya, Iba, 1300 m, 7.–8.IV.1993, leg. A. Riedel (SMNS).
Paratype: New Guinea, Irian Jaya, Testega, 1100–1200 m, 11.IV.1993, leg. A. Riedel, 1 ♀ (SMNS).

Description

Black including labrum, maxillar palpi fulvous with black apical segments, antennae black with the 3 basal segments fulvous (at least on underside), tarsal segment 3 dark fulvous.

Body elongate ovate. Head with extremely dense microsculpture and a silky appearance, with deep and sharp supraocular grooves. Antennae extending to anterior third of elytra, segments 2–10 subequal in length, preapical segments about twice as long as wide. Prothorax 1.6 times as wide as long, widest at its base, with almost straight lateral margins, surface with fine, not dense transverse punctures, interspaces flat, distinctly wider than length of punctures, with traces of microsculpture. Scutellum subquadrate with rounded apex, microsculptured. Elytra 1.3 times as long as wide, widest in the humeral area, strongly narrowed and produced posteriorly, surface with 11 regular rows of punctures, rather large in the anterior half, but much smaller posteriorly, interspaces not wider than punctures anteriorly, but 2–3 times as wide behind the middle. Femora with a small acute tooth on underside. Segment 1 of fore and mid tarsi slightly widened in the ♂, as long as wide. Aedeagus (Fig. 20) with tridentate apex, slightly concave on underside. Body length 2.6 mm in ♂, 2.9 mm in ♀.

Diagnosis

This new species is readily distinguished from all other species of the genus by the unusual sculpture of the head and the tridentate apex of the aedeagus.

*Stethotes laevicollis* **n. sp.**
(Figs. 46, 76)

Holotype (♀): Papua New Guinea, Morobe Prov., Aseki, 1000–1300 m, 13.X.1992, leg. A. Riedel (SMNS).
Paratypes: Same data as holotype, 2 ♀♀ (SMNS, LM).

Description

Black, labrum and vertex dark rufous, palpi pale flavous, antennae black with the 2 basal segments pale flavous, apices of tarsi dark rufous.

Body elongate ovate. Clypeus shining, with sparse punctures, frons and vertex microsculptured and impunctate, vertex with thin impressed line in the middle, supraocular grooves narrow. Antennae reaching to the anterior third of the elytra, proportions of segments 10-6-6-10-10-10-10-9-9-8-9, preapical segments nearly not widened, not less than 3 times as long as wide. Prothorax 1.6 times as wide as long, widest at its base, strongly narrowed anteriorly, surface shining and impunctate. Scutellum trapeziform with rounded apex, microsculptured. Elytra 1.35 times as long as wide, narrowed posteriorly (especially in posterior half), with acute apices, surface without postbasal impression, with 11 regular rows of punctures, which are moderately large in the anterior third and fine behind the middle, interspaces shining and flat. Femora each with a distinct triangular tooth on underside. Spermatheca U-shaped (Fig. 46). Body length 3.6–3.8 mm.

Diagnosis

This new species differs from *S. atra* Baly, 1867 in the impunctate prothorax, in the different sculpture of the head, and a different colouration. The other known species with impunctate prothorax, *S. apicalis* Gressitt, 1966, has a reddish-brown body, a smaller size, and traces of a weak transverse striation on the prothorax.

Group E

This group includes species with 11 regular or subregular rows of punctures and broadly rounded elytral apices.

Subgroup E 1

Elytra bicoloured. A single species was previously known, *S. suturalis* Bryant, 1950.

*Stethotes suturalis* Bryant, 1950
(Fig. 21)

Material examined
Papua New Guinea, Morobe Prov., Wau, Mt. Kaindi, 1850–2150 m, 8.X.1992, leg. A. Riedel, 3 ex. including ♂ (SMNS).

Remark

Aedeagus narrow, with rounded apex (Fig. 21).

*Stethotes fulvicornis* **n. sp.**
(Figs. 22, 78)

Holotype (♂): Papua New Guinea, Morobe Prov., Wau, Mt. Kaindi, near Edie Creek, 1900–2100 m, 7.II.1998, leg. A. Riedel (SMNS).
Paratypes: Same data as holotype, 2 ♂♂ (SMNS, LM). – Papua New Guinea, Morobe Prov., ridge between Aseki and

Menyamya, 2000–2200 m, 12.IV.1998, leg. A. RIEDEL, 1 ♂ (SMNS).

### Description

Head, prothorax and scutellum metallic bronze, labrum piceous, maxillar palpi fulvous, antennae fulvous or apical segments dark fulvous, elytra rufous with large basal triangle dark bronze, underside piceous, legs rufous or femora darkened basally.

Body robust. Head densely microsculptured and with not very distinct punctures, mostly on the frontoclypeus, supraocular groove narrow and deep. Antennae extending to the anterior third of the elytra, segments 2–10 subequal in length, preapical segments about twice as long as wide. Prothorax 1.45 times as wide as long, widest at its base, moderately narrowed anteriorly, with the lateral margins almost straight, surface finely microsculptured, with fine, sparse and mostly round punctures, interspaces much wider than punctures. Scutellum triangular, finely microsculptured. Elytra 1.2 times as long as wide, almost parallel-sided with broadly rounded apices, surface shining, with 11 rows of punctures, interspaces wide and flat. Femora each with a very small and acute tooth on underside. Segment 1 of fore and mid tarsi triangular in the ♂. Aedeagus (Fig. 22) with widely truncate apex and impression on underside before apex. Body length 2.3–3.0 mm.

### Diagnosis

This new species is similar to *S. suturalis* Bryant, 1950, but differs in the prothorax which is not strigose and the apex of the aedeagus which is widely truncate.

## *Stethotes rubripes* **n. sp.**
(Figs. 23, 79)

Holotype (♂): New Guinea, Irian Jaya, Jayawijaya, Jiwika, 1800–2300 m, 13.VI.1998, leg. A. RIEDEL (SMNS).

Paratype: Same data as holotype, 1 ♂ (LM).

Additional material (not treated as paratype because the vertex is longitudinally strigose): 1 ♂, same data as holotype.

### Description

Castaneous, basal antennal segments and labrum fulvous, elytra dark red with basal quarter castaneous and apices reddish castaneous, legs dark red.

Head dull, finely and sparsely punctate and microsculptured, vertex almost flat, ocular groove narrow, prolonged anteriorly and almost connected on the frons. Antennae reaching to the anterior fifth of the elytra, segments 2–10 subequal in length, preapical segments about twice as long as wide. Prothorax 1.7 times as wide as long, moderately narrowed anteriorly, with lateral margins almost straight, surface convex, finely and densely punctate, microsculptured, punctures much smaller than those on the elytra. Scutellum elongate triangular with rounded apex, impunctate. Elytra 1.35 times as long as wide, widest near base, narrowed posteriorly, with rounded apices, without postbasal convexity, with 11 rows of rather strong punctures, interspaces shining, flat, rather narrow, but mostly wider than diameter of punctures. Mid and hind femora with a very small tooth, fore femora untoothed, hind femora clavate. Segment 1 of fore and mid tarsi widened. Aedeagus (Fig. 23) distinctly widened in its apical third, with truncate apex, deeply concave in apical half of underside. Body length 2.3–2.5 mm.

### Diagnosis

This new species is similar to *S. suturalis* Bryant, 1950, but differs in the absence of a metallic colouration, the fine punctures on the prothorax, and different shape of the aedeagus.

### Subgroup E 2

Elytra distinctly metallic. Four species were previously included in this group: *S. cyanella* (Boisduval, 1835), *S. elegantula* (Baly, 1864), *S. nigroviridis* Jacoby, 1884, and *S. coerulescens* Gressitt, 1966.

## *Stethotes aenea* **n. sp.**
(Figs. 24, 80)

Holotype (♂): New Guinea, Irian Jaya, Jayawijaya, Bommela, 1750–2100 m, 1.IX.1992, leg. A. RIEDEL (SMNS).

Paratypes: Same data as holotype, 42 ex. (39 ex. SMNS, 3 ex. LM). – New Guinea, Irian Jaya, Jayawijaya, Bommela, 1750 m, 30.VIII.–1.IX.1992, leg. A. RIEDEL, 4 ex. (SMNS). – New Guinea, Irian Jaya, Jayawijaya, Langda, 2100–2300 m, 27.–28. VIII.1992, leg. A. RIEDEL, 2 ex. (SMNS). – New Guinea, Irian Jaya, Iba, 1300 m, 7.–8.IV.1993, leg. A. RIEDEL, 1 ex. (SMNS). – New Guinea, Irian Jaya, Jayapura, Sentani, Cyclops Mountains, 400–800 m, 7. VIII.1992, leg. A. RIEDEL, 1 ex. (SMNS). – Colour variation with blue elytra: New Guinea, Irian Jaya, Jayawijaya, Bommela, 1750–2100 m, 1.IX.1992, leg. A. RIEDEL, 3 ex. (SMNS). – New Guinea, Irian Jaya, Iba, 1300 m, 7.–8.IV.1993, leg. A. RIEDEL, 1 ex. (SMNS).

### Description

Upperside metallic golden cupreous (elytra very rarely blue), underside darker, labrum and palpi fulvous, antennae piceous to black with the 5 basal segments fulvous, legs fulvous, femora and tarsi with blackish apices.

Body elongate. Head microsculptured, finely and sparsely punctate, vertex with deep supraocular groove and with obtuse ridge just above this groove. Antennae reaching to the anterior third of the elytra, segments 2–10 subequal in length, preapical segments about 2.5 times as long as wide. Prothorax 1.5 times as wide as long, widest

at its base, barely rounded laterally, surface with moderately large and dense punctures, interspaces microsculptured, mostly wider than diameter of punctures. Scutellum triangular with rounded apex, microsculptured. Elytra 1.45 times as long as wide, almost parallel-sided with the apices broadly rounded, surface with 11 regular rows of punctures, which are larger than those on prothorax, interspaces a little wider than diameter of punctures, microsculptured, slightly convex. Mid and hind femora with a minute tooth. Segment 1 of fore tarsi not distinctly thickened in the ♂, elongate, about twice as long as wide. Aedeagus (Fig. 24) widened towards the apex, with a wide, slightly concave apical margin. Body length 2.0–3.0 mm.

Diagnosis

This new species is similar to *S. nigroviridis* Jacoby, 1884, but differs in the colouration and punctuation of the upperside, the sculpture of the head, and a more transverse prothorax.

*Stethotes costipennis* **n. sp.**
(Figs. 25, 82)

Holotype (♂): New Guinea, Irian Jaya, Anggi, Tetaho Kosmena, 1400–1750 m, 26.–28.III.1993, leg. A. Riedel (SMNS).

Paratypes: Same data as holotype, 23 ex. (20 ex. SMNS, 3 ex. LM). – New Guinea, Irian Jaya, Testega, 1100–1300 m, 30.III.–2.IV.1993, leg. A. Riedel, 1 ex. (SMNS). – New Guinea, Irian Jaya, Anggi, Iray, Gunung Disbehey, 1900–2100 m, 19.–20.III.1993, leg. A. Riedel, 1 ex. (SMNS).

Description

Upperside metallic golden cupreous, underside greenish cupreous, labrum and palpi fulvous, antennae piceous or black with the 5–6 basal segments fulvous, legs fulvous with the apices of femora and tarsi blackish.

Body elongate. Head microsculptured, finely and densely punctate, partly strigose on the vertex, with deep and wide supraocular groove. Antennae reaching to the anterior third of the elytra, preapical segments about twice as long as wide. Prothorax 1.5 times as wide as long, widest before its base, barely rounded laterally, surface with dense and rather large punctures, interspaces microsculptured, mostly not wider than diameter of punctures. Scutellum elongate triangular with rounded apex, microsculptured. Elytra 1.3 times as long as wide, slightly widened posteriorly, with broadly rounded apices, surface with 11 regular rows of punctures, which are a little larger than those on the prothorax, interspaces strongly costate, shining, not wider than diameter of punctures. Femora each with a very small acute tooth. Segment 1 of fore tarsi slightly widened in the ♂, triangular, slightly longer than wide. Aedeagus (Fig. 25) nearly not widened towards the apex, with wide apical margin bearing a small triangular incisure in the middle. Body length 2.2–3.0 mm.

Diagnosis

This new species is very similar to the preceding species, but differs in the stronger punctures on head and prothorax, the costate elytra, and the shape of the aedeagus.

*Stethotes gressitti* **n. sp.**
(Figs. 26, 81)

Holotype (♂): New Guinea, Irian Jaya, Anggi, Tetaho Kosmena, 1400–1750 m, 26.–28.III.1993, leg. A. Riedel (SMNS).

Paratypes: Same data as holotype, 40 ex. (SMNS). – New Guinea, Irian Jaya, Testega, 1100–1300 m, 30.III.–2.IV.1993, leg. A. Riedel, 1 ex. (LM). – New Guinea, Irian Jaya, Iba, 1300 m, 7.–8.IV.1993, leg. A. Riedel, 7 ex. (SMNS).

Etymology

The name of this new species is dedicated to the late Dr. Judson Linsley Gressitt (1914–1982), who was the first reviser of this interesting genus.

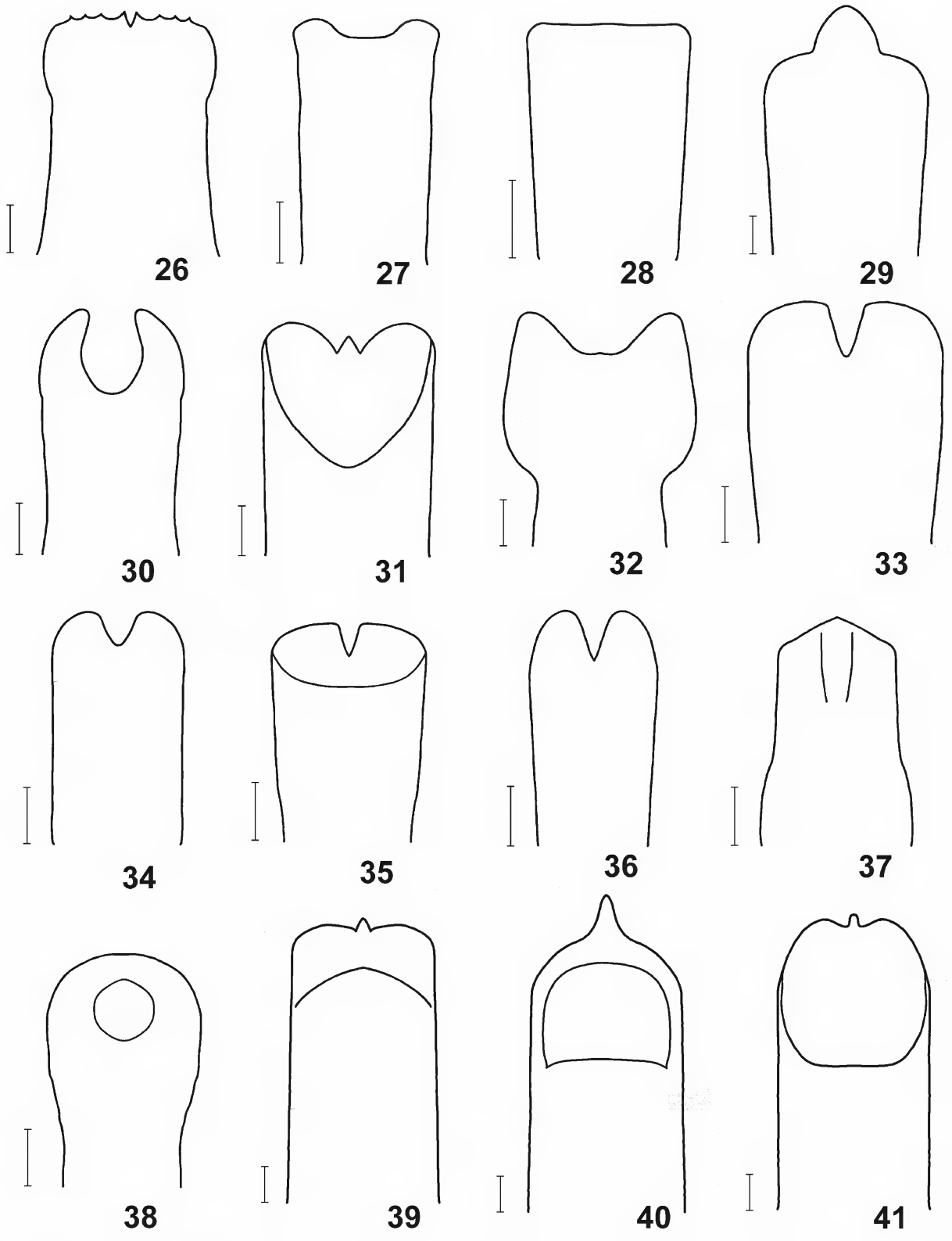
Description

Dark metallic blue, occasionally with greenish tint, labrum piceous, palpi and underside of the 3 or 4 basal antennal segments fulvous.

Body elongate ovate. Head microsculptured and strongly punctate, supraocular grooves deep and very wide, prolonged anteriorly. Antennae reaching to the anterior third of the elytra, segments 2–10 subequal in length, preapical segments about 2.5–2.7 times as long as wide. Prothorax 1.2–1.3 times as wide as long, conical, with acute anterior angles, surface with minute microsculpture and rather strong, moderately dense punctures. Scutellum elongate triangular with rounded apex, microsculptured, with a few punctures. Elytra 1.3 times as long as wide, with slightly arcuate lateral margins and broadly rounded apices, surface with 11 regular rows of strong punctures, which are a little larger than those on sides of prothorax, interspaces shining, flat, as wide as or a little wider than diameter of punctures. Femora each with an acute and moderately long tooth on underside. Segment 1 of fore and mid tarsi widened in the ♂, triangular. Aedeagus (Fig. 26) with truncate and serrate apex and two long, distinct inner teeth; underside flat, with minute strigosity. Body length 3.3–3.8 mm.

Diagnosis

This new species is similar to *S. coerulescens* Gressitt, 1966 and *S. virida* Gressitt, 1966, but differs in the shape of the aedeagus and the different colouration of the upper-




**Figs. 26–41.** *Stethotes* spp., aedeagus, ventral views; *Gressittella* spp., aedeagus, dorsal views. – **26**. *S. gressitti* n. sp. **27**. *S. balyi* n. sp. **28**. *S. iriana* n. sp. **29**. *S. granulifrons* n. sp. **30**. *S. nigripalpis* n. sp. **31**. *S. obscurata* n. sp. **32**. *S. tarsalis* n. sp. **33**. *S. carbonaria* n. sp. **34**. *Stethotes nigrescens* n. sp. **35**. *S. jacobyi* n. sp. **36**. *S. arachnoides* n. sp. **37**. *S. aethiops* n. sp. **38**. *S. hirticollis* n. sp. **39**. *Gressittella riedeli* n. sp. **40**. *G. obscura* n. sp. **41**. *G. laevis* n. sp. – Scales: 0.1 mm.

side. From the poorly known species *S. cyanella* (Boisduval, 1835), the new species differs in its strong punctures on the prothorax.

Subgroup E 3

Elytra black, sometimes with a slight metallic sheen.

Subgroup E 3.1

Interspaces of elytral rows strongly costate. – This morphological type was previously unknown from New Guinea.

*Stethotes balyi* **n. sp.**
(Figs. 27, 83)

Holotype (♂): New Guinea, Irian Jaya, Japen Isl., Kontiunai, 600–700 m, 25.XII.2000, leg. A. Riedel (SMNS).

Paratypes: New Guinea, Irian Jaya, Jayawijaya, Emdoman, 900–1200 m, 29.IX.1993, leg. A. Riedel, 1 ♀ (SMNS).

Etymology

This new species is dedicated to Dr. Joseph Baly (1816–1890), who first described this interesting genus.

Description

Black, labrum with fulvous margins, antennae fulvous with segments 7–9 darkened and segment 1 black above, apices of tarsi fulvous, vertex with a slight metallic sheen.

Body robust, 1.4 times as long as wide. Head densely microsculptured, with sparse punctures, supraocular grooves narrow, deep, prolonged anteriorly to the frons. Antennae reaching to the elytral humerus, segments 2–10 subequal in length, preapical segments about 2.5 times as long as wide. Prothorax 1.5 times as wide as long, slightly narrowed anteriorly, with rounded lateral margins, surface microsculptured, with strong and mostly elongate punctures, interspaces as wide as punctures. Scutellum trapeziform with rounded apex, microsculptured. Elytra 1.15 times as long as wide, parallel-sided with broadly rounded apices, surface with 11 rows of large punctures, costate interspaces and a weak postbasal impression. Femora each with a small acute tooth. Segment 1 of fore and mid tarsi moderately widened. Aedeagus (Fig. 27) with a broad apex which is emarginated in the middle, underside concave. Body length 2.2–2.5 mm.

Diagnosis

This new species differs from all other New Guinean species in the combination of a black upperside and costate elytra.

*Stethotes iriana* **n. sp.**
(Figs. 28, 84)

Holotype (♂): New Guinea, Irian Jaya, Sorong Prov., Salawatti Isl., SP-2, Waijan, 50–100 m, 23.–25.X.1996, leg. A. Riedel (SMNS).

Paratype: Same data as holotype, 1 ♂ (SMNS).

Description/Diagnosis

Colouration and morphological structure identical with the preceding species (but the labrum is fulvous with its base black), but differing in the shape of the aedeagus (Fig. 28), which has a truncate apex without emargination in the middle. Body length 1.9–2.0 mm.

Subgroup E 3.2

Interspaces of the elytral rows flat or slightly convex. Two species of this group were previously known, *S. nigritula* Baly, 1867 and *S. mimica* Gressitt, 1966.

The new species described below all differ from *S. mimica* in the shape of the aedeagus, and from *S. nigritula* in the sculpture of the head (never with combination of a granulated head and a smooth clypeus).

*Stethotes granulifrons* **n. sp.**
(Fig. 29)

Holotype (♂): New Guinea, Irian Jaya, Jayawijaya, Borme, 1000–1300 m, 13.–18.VIII.1992, leg. A. Riedel (SMNS).

Paratype: Same data as holotype, 1 ♀ (SMNS).

Description

Black, head dark rufous, labrum rufous, palpi pale flavous, antennae black with the 2 basal segments fulvous, apices of tarsi fulvous.

Body robust, ovate. Head with extremely dense and fine granulation, vertex also with traces of shallow punctures, supraocular grooves deep and sharp. Antennae reaching to the anterior third of the elytra, segments 4 and 5 thin and long, the other segments shorter and subequal in length, preapical segments slightly thickened, about 2.5 times as long as wide. Prothorax 1.5–1.6 times as wide as long, widest at its base, with rounded lateral margins, surface with strong and dense, partly transverse punctures, interspaces much narrower than punctures. Scutellum trapeziform with rounded apex, microsculptured. Elytra 1.2 times as long as wide, with its lateral margins slightly rounded and moderately narrowed to broadly rounded apices, with 11 rows of punctures, which are larger than those on prothorax, interspaces shining, mostly as wide as or a little wider than diameter of punctures.

Femora each with a moderately long and acute tooth on underside. Segment 1 of fore and mid tarsi very distinctly widened, triangular, as long as wide. Aedeagus (Fig. 29) with a wide apical process. Body length 3.2–3.3 mm.

Diagnosis

This new species differs from all other species of this group in its wide apical process of the aedeagus.

*Stethotes nigripalpis* **n. sp.**
(Fig. 30)

Holotype (♂): New Guinea, Irian Jaya, Jayawijaya, Bime, 1600–1900 m, 11.IX.1993, leg. A. Riedel (SMNS).
Paratype: Same data as holotype, 1 ♂ (LM).

Description

Black including labrum and palpi, head with a slight greenish tint, the 5 basal antennal segments fulvous, apices of tarsi piceous.

Body robust. Head microsculptured and punctate, supraocular groove wide and deep. Antennae reaching to the anterior third of the elytra, segments 2–10 subequal in length, preapical segments distinctly widened, about twice as long as wide. Prothorax 1.4 times as wide as long, conical, surface microsculptered, with strong and dense punctures, interspaces as wide as or wider than punctures. Scutellum triangular with rounded apex, microsculptured. Elytra half as long as wide, widest in the anterior third, lateral margins slightly arcuate, apices broadly rounded, humeral tubercle low, surface with 11 regular rows of punctures, which are a little larger than those on prothorax, interspaces shining, flat, mostly as wide as diameter of punctures. Femora each with a small acute tooth on underside. Segment 1 of fore and mid tarsi distinctly widened, but not wider than tibia, triangular. Aedeagus bifurcate, with branches converging towards the apex, underside longitudinally concave in the middle (Fig. 30). Body length 2.5–2.6 mm.

Diagnosis

This new species differs differs from all the other species of this group in its black maxillar palpi and the very deep apical excavation of the aedeagus.

*Stethotes obscurata* **n. sp.**
(Fig. 31)

Holotype (♂): New Guinea, Irian Jaya, Testega, 1100–1300 m, 30.III.–2.IV.1993, leg. A. Riedel (SMNS).

Description

Black including labrum, head with a slight greenish tint, the 5 basal antennal segments, palpi and tarsal segment 3 fulvous.

Aedeagus with a shallow and wide apical excavation, underside with an apical impression arcuately delimited basally (Fig. 31). Body length 2.7 mm.

Diagnosis

This new species is morphologically nearly identical with the preceding species, but punctures of prothorax and elytra are practically of the same size, and interspaces of elytral rows are wider than diameter of punctures; the main difference is a distinctly other type of the aedeagus.

*Stethotes tarsalis* **n. sp.**
(Figs. 32, 45)

Holotype (♂): New Guinea, Irian Jaya, Meydoudga, 1200–1400 m, 5.IV.1993, leg. A. Riedel (SMNS).

Description

Black including labrum, palpi pale flavous, the 6 basal antennal segments and the apices of tarsi fulvous, extreme apices of elytra indistinctly rufous, legs piceous.

Body robust. Head microsculptured and rather strongly punctate, supraocular grooves narrow and deep. Antennae reaching to the anterior third of the elytra, segments 2–10 subequal in length, preapical segments slightly widened, about 3 times as long as wide. Prothorax 1.3 times as wide as long, slightly narrowed anteriorly, surface microsculptured, with strong and dense punctures, interspaces smaller or as wide as punctures. Scutellum elongate triangular with narrowly rounded apex, microsculptured. Elytra 1.2 times as long as wide, widest at its base, with slightly rounded lateral margins, broadly rounded apices and a weak humeral tubercle, with 11 regular rows of large punctures, which are larger than those on prothorax, interspaces smooth, mostly narrower than punctures. Femora each with an acute tooth on underside. Segment 1 of fore and mid tarsi strongly widened in the ♂, very large, much wider than the tibia. Aedeagus (Fig. 32) wide, with a trapeziform excavation on the apex. Body length 3.3 mm.

Diagnosis

This new species differs from all the other species of this group in having a very large segment 1 of fore and mid tarsi, and a different shape of the aedeagus.

*Stethotes carbonaria* **n. sp.**
(Fig. 33)

Holotype (♂): New Guinea, Irian Jaya, Manokwari, Gunung Meja, 200 m, 19.IV.1993, leg. A. Riedel (SMNS).

Description

Black, basal antennal segments and palpi fulvous.

Body robust. Head microsculptured, with a few punctures on clypeus and near eyes, vertex with a V-shaped impression, supraocular grooves deep and very wide, prolonged anteriorly and interconnected on the frons. Antennae almost reaching to the middle of the elytra, segments 2–10 subequal in length in length, preapical segments about 2.5 times as long as wide. Prothorax 1.4 times as wide as long, narrowed anteriorly, with slightly rounded lateral margins, surface without distinct microsculpture, with strong and moderately dense punctures laterally and fine sparse punctures in the middle. Scutellum triangular with rounded apex, shining and impunctate. Elytra 1.2 times as long as wide, broadly rounded apically, with 11 rows of strong punctures, which are distinctly larger than those on sides of prothorax, interspaces mostly narrower than diameter of punctures. Femora with a very small acute tooth on underside, almost indistinct on fore legs. Segment 1 of fore and mid tarsi widened, triangular. Aedeagus (Fig. 33) bifurcate, flat on underside. Body length 2.1 mm.

Diagnosis

This new species differs from the other species of this group in the sculpture of its head and the shape of its aedeagus.

*Stethotes nigrescens* **n. sp.**
(Fig. 34)

Holotype (♂): New Guinea, Irian Jaya, Jayawijaya, Emdoman, 800–1200 m, 14.–15.IX.1992, leg. A. Riedel (SMNS).

Description

Black, palpi and third tarsal segment fulvous, antennae piceous with fulvous basal and apical segments.

Body robust. Head with dense microsculpture, supraocular grooves narrow, prolonged anteriorly and interconnected on the frons. Antennae reaching to the anterior third of the elytra, segments 2–10 subequal in length, preapical segments about twice as long as wide. Prothorax 1.4 times as wide as long, narrowed anteriorly, with straight lateral margins, surface microsculptured and finely punctate, punctures dense laterally and very sparse in the middle. Elytra 1.25 times as long as wide, broadly rounded apically, with 11 regular rows of punctures, which are distinctly larger than those on prothorax, interspaces mostly narrower than diameter of punctures. Femora each with an acute tooth on underside. Segment 1 of fore and mid tarsi widened in the ♂. Aedeagus (Fig. 34) with bifurcate apex and almost flat on underside. Body length 2.4 mm.

Diagnosis

This new species differs from all the other species of this group in the punctures on the prothorax, and in the shape of the aedeagus.

*Stethotes jacobyi* **n. sp.**
(Fig. 35)

Holotype (♂): New Guinea, Irian Jaya, Sorong Prov., Batanta Isl., ca. 41 km W Yenanas, 0–250 m, 5.XI.1996, leg. A. Riedel (SMNS).

Etymology

This new species is dedicated to Martin Jacoby (1842–1907), an eminent investigator of the family Chrysomelidae.

Description

Black, palpi fulvous, antennae piceous with fulvous basal segments.

Body robust. Head microsculptured, with a few punctures on the vertex, supraocular grooves very wide, deep, prolonged anteriorly and almost interconnected on the frons. Antennae reaching to the middle of the elytra, segments 2–10 subequal in length, preapical segments about twice as long as wide. Prothorax 1.6 times as wide as long, slightly narrowed anteriorly, with slightly arcuate lateral margins, surface shining, with moderately strong, not dense punctures, interspaces mostly twice as wide as diameter of punctures. Scutellum triangular with rounded apex, shining and impunctate. Elytra 1.25 times as long as wide, with slightly arcuate lateral margins and broadly rounded apices, surface with 11 regular rows of strong punctures, which are larger than those on prothorax, interspaces smooth, on dorsum as wide as diameter of punctures, smaller laterally. Femora each with a short acute tooth on underside. Segment 1 of fore and mid tarsi slightly widened. Aedeagus (Fig. 35) with subtruncate apex, which has a small triangular incisure in the middle. Body length 2.2 mm.

Diagnosis

This new species differs from the other species of this group in having a sparsely punctate prothorax, and a different shape of the aedeagus.

### *Stethotes arachnoides* **n. sp.**
(Fig. 36)

Holotype (♂): New Guinea, Irian Jaya, Manokwari, Gunung Meja, 200 m, 19.IV.1993, leg. A. Riedel (SMNS).
Paratype: Same data as holotype, 1 ♀ (SMNS).

#### Description

Black with slight metallic tint, labrum piceous, palpi and the 3 basal antennal segments fulvous, but segment 1 darkened above.

Body robust, short ovate. Head densely microsculptured, with sparse punctures, supraocular grooves deep and very wide, especially posteriorly, prolonged anteriorly and almost interconnected on the frons. Antennae reaching to the anterior third of the elytra, segments 2–10 subequal in length, preapical segments about twice as long as wide. Prothorax 1.4 times as wide as long, widest at its base, clearly narrowed to the anterior margin, surface microsculptured, with large, but not dense punctures, interspaces mostly wider than punctures. Scutellum triangular with rounded apex, shining. Elytra 1.25 times as long as wide, more or less parallel-sided and only behind the middle narrowed to broadly rounded apices, surface with 11 rows of punctures, as large as those on prothorax, interspaces shining, not wider than diameter of punctures. Legs very long, especially fore and hind legs of the ♂: fore legs 2.5 mm, hind legs 2.8 mm (1.2 times as long as body), femora each with a very small acute tooth on underside. Segment 1 of fore and mid tarsi slightly widened, triangular. Aedeagus (Fig. 36) bifurcate, with flat underside. Body length 2.3–2.5 mm.

#### Diagnosis

This new species is clearly distinguished from the other species of the group by its strongly elongated legs (especially hind and fore legs of the ♂) and the shape of the aedeagus.

### *Stethotes hirticollis* **n. sp.**
(Figs. 38, 85)

Holotype (♂): New Guinea, Irian Jaya, Jayawijaya, Bommela, 1750–2100 m, 1.IX.1992, leg. A. Riedel (SMNS).
Paratypes: Same data as holotype, 3 ex. (SMNS). – New Guinea, Irian Jaya, Jayawijaya, Elpomek, 1800–2300 m, 5.IX.1992, leg. A. Riedel, 8 ex. (6 ex. SMNS, 2 ex. LM). – New Guinea, Irian Jaya, Jayawijaya, Bime, 1600–1900 m, 11.IX.1993, leg. A. Riedel, 4 ex. (SMNS).

#### Description

Aeneous or bronze aeneous, labrum and occasionally also clypeus fulvous, antennae black with fulvous basal segments, outer part of elytra often more or less fulvous with a metallic sheen, legs fulvous with darkened apices of femora. Pubescence of prothorax white.

Head densely punctate and microsculptured, partly strigose behind the eyes, vertex with central groove, ocular grooves very weak, indistinct. Antennae reaching to the anterior third of the elytra, segments 2–10 subequal in length, preapical segments about twice as long as wide. Prothorax 1.25 times as wide as long, widest before its base, slightly narrowed anteriorly, with its lateral margins slightly rounded, surface strongly and densely punctate, interspaces convex and mostly smaller than punctures, pubescence not dense, suberect. Scutellum triangular with rounded apex, microsculptured. Elytra 1.30–1.35 times as long as wide, parallel-sided (♂) or slightly widened posteriorly (♀), elytral rows with large deep punctures, interspaces shining, about as wide as punctures in rows. Segment 1 of fore and mid tarsi moderately widened. Aedeagus (Fig. 38) with subtruncate apex, preapically grooved on underside. Body length 2.1–2.7 mm.

#### Diagnosis

This new species clearly differs from the other species of *Stethotes* in its pubescent prothorax.

## Genus *Gressittella* **n. gen.**

Type species: *G. riedeli* n. sp.

#### Etymology

The name of the new genus is dedicated to the late Dr. Judson Linsley Gressitt (1914–1982), who investigated the family Chrysomelidae from New Guinea. The gender of the genus name is feminine.

#### Description

Body wide, elongate ovate. Head with Y-shaped suture, which may be very weak or indistinct, narrowly grooved near the eyes; sculpture of head very variable. Antennae thin, with the apical segments not widened. Prothorax transverse, a little narrower than elytra at base, margined laterally, anterior setigerous pore situated on the anterior angle. Elytra confusedly punctate. Epipleura not wide, slightly narrowed posteriorly, disappearing before extreme apex. Proepisterna triangular, not reaching to the anterior angles of the prothorax, with straight or barely convex anterior margin. Fore femora with a well developed and relatively large tooth on underside, mid and hind femora with very small tooth. Claws bifid in their apical half.

#### Diagnosis

The new genus is distinguished from the other genera with toothed femora as shown in the following key:

**1** Eyes large, wider than frons. – All femora strongly toothed. Anterior margin of proepisterna strongly convex. . . . . ***Thysaria*** Jacoby, 1884
– Eyes smaller than interocular space. . . . . **2**
**2** Head lacking a deep groove above the eye. Body almost circular. . . . . ***Iviva*** Gressitt, 1969
– Head with a deep groove above the eye. Body not circular. **3**
**3** Fore femora untoothed or very weakly toothed, hind femora finely toothed. – Elytra with regular rows of punctures. . . . . ***Rhyparidella*** Gressitt, 1969
– All femora distinctly toothed. . . . . **4**
**4** Head swollen above, prothorax very strongly convex. Anterior margin of proepisterna strongly convex. – Elytra with regular rows of punctures. . . . . ***Stethotes*** Baly, 1867
– Head not swollen above, prothorax moderately convex. Anterior margin of proepisterna not distinctly convex, often more or less straight. . . . . **5**
**5** Elytra regularly punctate. All femora distinctly toothed, but tooth of fore femora not larger than the other ones. Body short ovate. . . . . ***Phainodina*** Gressitt, 1969
– Elytra confusedly punctate. Fore femora with a large, mid and hind femora with a small tooth. Body large, elongate ovate. . . . . ***Gressittella*** **n. gen.**

### *Gressittella riedeli* **n. sp.**
(Figs. 39, 86)

Holotype (♂): New Guinea, Irian Jaya, Jayawijaya, Bime, 1600–1900 m, 11.IX.1993, leg. A. Riedel (SMNS).

Paratypes: Same data as holotype, 3♂♂, 1♀ (2 ex. SMNS, 2 ex. LM). – New Guinea, Irian Jaya, Jayawi-Galbok b. Nalca, 1700–1800 m, 3.X.1993, leg. A. Riedel, 2♀♀ (SMNS). – New Guinea, Irian Jaya, Jayawijaya, Taramlu, 1500–1700 m, 6.IX.1993, leg. A. Riedel, 1♀ (SMNS). – New Guinea, Irian Jaya, Jayawijaya, Okloma, 1650–1800 m, 1.X.1993, leg. A. Riedel, 1♂ (SMNS). – New Guinea, Irian Jaya, Jayawijaya, Bommela, 1700 m, 4.X.1996, leg. A. Riedel, 2♂♂, 1♀ (SMNS). – Papua New Guinea, Southern Highland Prov., Tari-Koroba Hake, 1700–2000 m, 14.V.1998, leg. A. Riedel, 1♀ (SMNS).

#### Etymology

The new species is dedicated to its collector, Dr. Alexander Riedel (Karlsruhe).

#### Description

Dark fulvous, underside almost castaneous; vertex with a spot, intermediate antennal segments except apices (usually segments 4–8), irregular spots on prothorax, punctures and irregular spots on elytra, apices of femora and the middle of tibiae black.

Head with distinct Y-shaped suture, frontoclypeus rugosely punctate, anterior margin of clypeus deeply emarginated, vertex microsculptured and with sparse minute punctures. Antennae reaching to the middle of the elytra, segments 3–11 subequal in length, segment 3 about 1.5 times as long as segment 2. Prothorax 1.8 times as wide as long, with rounded lateral margins, widest just behind the middle, surface with large sparse punctures and numerous convex callosities, partly round, partly worm-like. Scutellum triangular with broadly rounded apex, microsculptured. Elytra 1.15–1.20 times as long as wide, without basal convexity and postbasal impression, with large and deep confused punctures, with 1–2 more or less regular rows along suture. Fore femora with a large tooth, mid and hind femora with a very small but acute tooth. Segment 1 of fore and mid tarsi nearly not widened in the ♂. Aedeagus see Fig. 39. Body length 6.5–6.8 mm in ♂, 6.7–7.2 mm in ♀.

#### Diagnosis

See diagnoses of *Gressittella obscura* and *G. laevis* below.

### *Gressittella obscura* **n. sp.**
(Figs. 40, 87)

Holotype (♂): Papua New Guinea, Vanimo, Denake-Range, 500 m, 28.–29.X.1992, leg. A. Riedel (SMNS).

#### Description

Piceous to dark piceous, basal antennal segments, palpi and labrum more or less fulvous.

Head strongly, partly rugosely punctate with microsculptured interspaces, Y-shaped suture rather weak, with lateral branches not quite distinct because of rough punctures, anterior margin of clypeus almost straight. Antennae reaching to the middle of the elytra, segments 3–11 subequal in length, segment 3 about 1.5 times as long as segment 4. Prothorax 1.5 times as wide as long, with rounded lateral margins, widest in the middle, surface microsculptured and strongly punctate. Scutellum subquadrate with rounded apex. Elytra 1.45 times as long as wide, without basal convexity and postbasal impression, with large and deep, partly foveate punctures, especially anteriorly. Fore femora with a large tooth, mid and hind with a very small tooth. Segment 1 of fore and mid tarsi not widened in the ♂. Aedeagus see Fig. 40. Body length 6.7 mm.

#### Diagnosis

This new species is clearly distinguished from the preceding species by its strongly punctate vertex, the less distinct Y-shaped suture, the absence of callosities on the prothorax, and the larger elytral punctures.

### *Gressittella laevis* **n. sp.**
(Fig. 41)

Holotype (♂): New Guinea, Irian Jaya, Jayawijaya, Bommela, 1700–1950 m, 4.X.1996, leg. A. Riedel (SMNS).

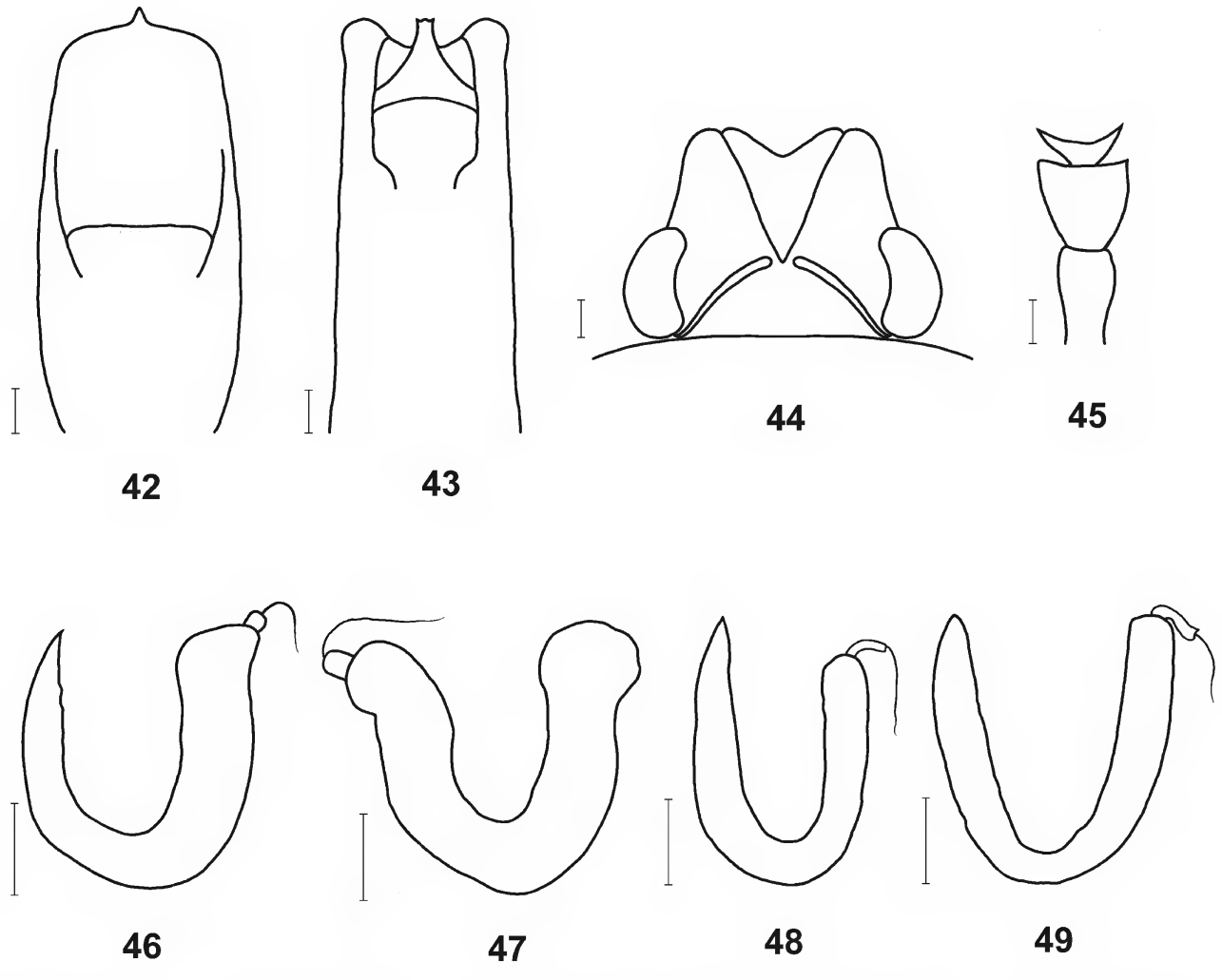
Description

Red fulvous with underside darker, elytral punctures with black halos, which are partly connected forming irregular spots.

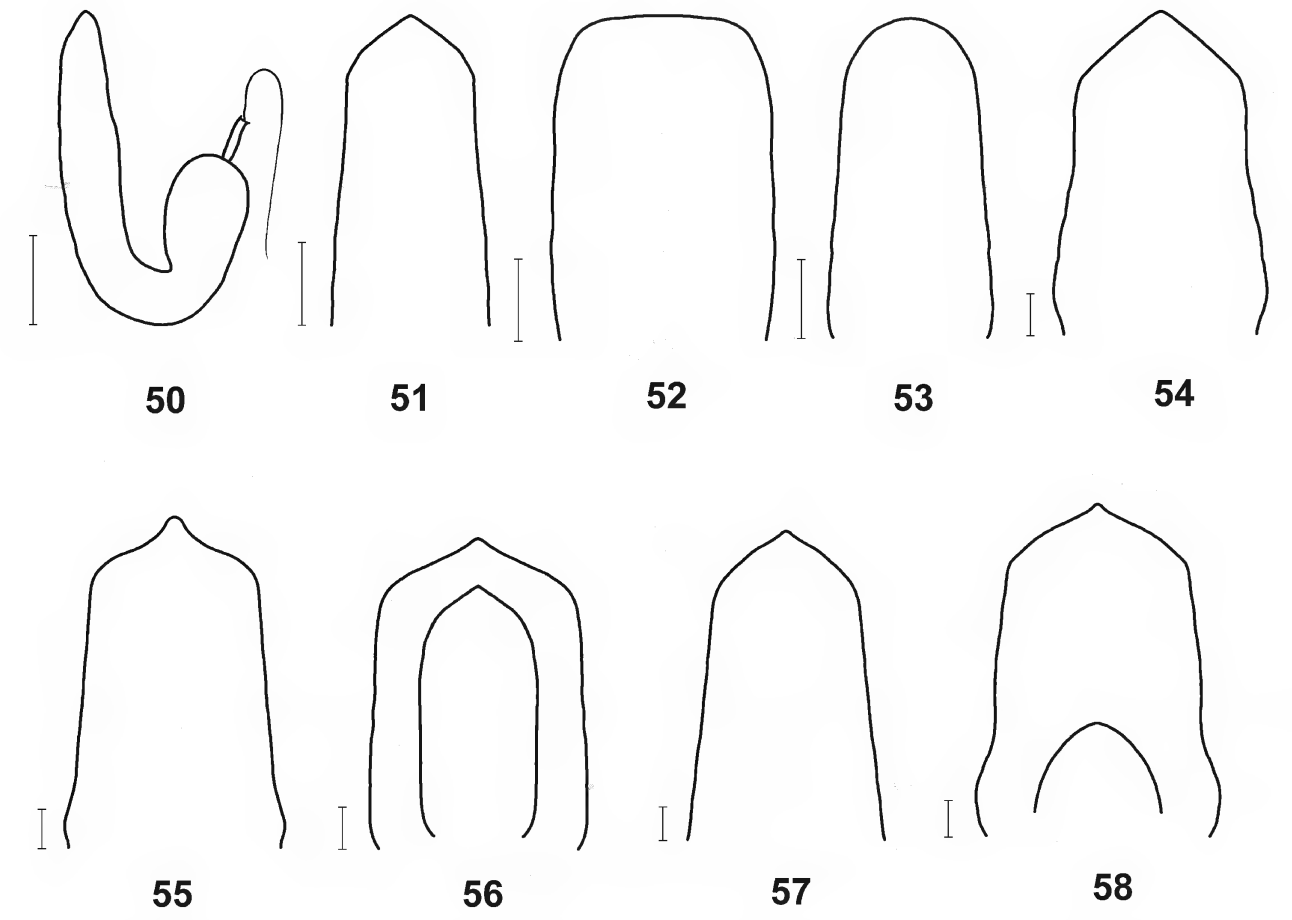
Head shining, nearly impunctate, Y-shaped suture indistinct, anterior margin of clypeus arcuately emarginated. Antennae reaching to the middle of the elytra, segments 3–11 subequal in length, segment 3 about 1.5 times as long as segment 2. Prothorax 1.75 times as wide as long, with rounded lateral margins, widest behind the middle, surface shining and impunctate. Scutellum triangular, with acute apex. Elytra 1.25 times as long as wide, with weak basal convexity and postbasal depression, surface shining, sparsely and not deeply punctate, punctures near the suture and lateral margins more or less arranged in irregular rows. Fore femora with a large tooth, mid and hind femora with a very small tooth. Segment 1 of fore and mid tarsi slightly thickened. Aedeagus see Fig. 41. Body length 7.2 mm.

Diagnosis

This new species differs from both preceding species in its weak or indistinct Y-shaped suture, the impunctate head and prothorax, the absence of microsculpture on head and upperside, and its relatively fine elytral punctures.




**Figs. 42–49.** Chrysomelidae. – **42**. *Rhyparida goilalae* n. sp., aedeagus, dorsal view. **43**. *Gressittana sculpturata* (Gressitt), aedeagus, dorsal view. **44**. *Rhyparidella riedeli* n. sp., head. **45**. *Stethotes tarsalis* n. sp., apex of tibia and basal segments of anterior tarsus. – **46–50**. Spermatheca. **46**. *Stethotes laevicollis* n. sp. **47**. *Cleorina pulchra* n. sp. **48**. *C. flavipes* n. sp. **49**. *C. femorata* n. sp. – Scales: 0.1 mm.




**Figs. 50–58.** Chrysomelidae. – **50**. *Cleorina nigricornis* n. sp., spermatheca. – **51–58**. Aedeagus, ventral views. **51**. *Scelodonta iriana* n. sp. **52**. *Cleorina hirticollis* Bryant. **53**. *C. viridissima* Jacoby. **54**. *C. femorata* Jacoby. **55**. *C. schawalleri* n. sp. **56**. *C. bryanti* n. sp. **57**. *C. nigricornis* n. sp. **58**. *C.* sp. D. – Scales: 0.1 mm.

Genus *Rhyparida* Baly, 1861

*Rhyparida goilalae* Gressitt, 1967
(Figs. 42, 90)

Material examined

Papua New Guinea, Morobe Prov., ca. 10 km S Garaina, Saureri, 1800–2150 m, 26.III.1998, leg. A. Riedel, 1 ♂, 1 ♀ (SMNS).

Remark

The original description of *Rhyparida goilalae* was based on the female gender. The aedeagus is figured in the present paper (Fig. 42).

Genus *Gressittana* **n. gen.**

Type species: *Rhyparida sculpturata* Gressitt, 1967.

Etymology

The name of this new genus is dedicated to Dr. Judson Linsley Gressitt (1914–1982), who investigated the family Chrysomelidae from New Guinea. The gender of the genus name is feminine.

Description

Body wide, elongate ovate. Head with Y-shaped suture, and deeply but not widely grooved near the eyes. Vertex densely microsculptured, finely punctate, frontoclypeus strongly punctate, interocular space a little wider than the anterior margin of the frontoclypeus. Antennae thin, apical segments not widened. Prothorax transverse, as wide as elytra at base, margined laterally, anterior setigerous pore situated on the anterior angle; surface rugosely punctate, partly with longitudinal rugosities and a few raised impunctate areas. Elytra confusedly punctate, basal convexity very weak, postbasal impression very shallow, but more or less distinct; an obtuse ridge in the

apical half near and parallel to the lateral margin. Elytral epipleuron disappearing in the apical fifth. All femora untoothed. Claws bifid in apical half. Proepisterna triangular, not reaching to the anterior angles of the prothorax, slightly concave on the anterior margin.

Diagnosis

*Gressittana* n. gen. is similar to *Rhyparida* Baly, 1861 and its single species was previously included in that genus (GRESSITT 1967b), but it differs in the elytral epipleura, which are bent over and indistinct in the apical part, and in the confusedly punctate and preapically subcarinate elytra. These characters are unusual among most species of *Rhyparida*, including its genotype. Already GRESSITT (1967b: 562) indicated that "a new genus may have to be erected for this species".

*Gressittana sculpturata* (Gressitt, 1967)
(Figs. 43, 88)

Material examined

Papua New Guinea, Morobe Prov., ca. 10 km S Garaina, Saureri, 1800–2150 m, 26.III.1998, leg. A. RIEDEL, 1 ♂, 1 ♀ (SMNS). – New Guinea, Irian Jaya, Manokwari, Gunung Meja, 200 m, 19.IV.1993, leg. A. RIEDEL, 1 ♂ (SMNS).

Remark

The original description was based on the female gender. A figure of the aedeagus is provided in the present paper (Fig. 43).

2.2.2 Tribe Scelodontini

*Scelodonta iriana* **n. sp.**
(Figs. 51, 89)

Holotype (♂): New Guinea, Irian Jaya, Biak Isl., Korim, Wouna, 21.–22.IV.1993, leg. A. RIEDEL (SMNS).

Paratypes: Same data as holotype, 1 ♂ (LM). – New Guinea, Irian Jaya, Biak Isl., Sepse, 3.X.1990, leg. A. RIEDEL, 1 ♂ (SMNS).

Description

Dark bronze or blackish bronze with a more or less distinct purple sheen on the upperside, especially on the elytra; antennae and underside darker, almost black; upperside not pubescent, head, underside and legs with white pubescence.

Head strongly and densely punctate, anterior margin of clypeus triangularly emarginated, vertex with very distinct longitudinal furrow, supraocular grooves deep. Antennae reaching to the base of the elytra, proportions of segments 10-5-5-5-6-6-8-8-8-8-11, preapical segments slightly thickened, about 2.0–2.4 times as long as wide. Prothorax 1.2 times as wide as long, widest in the middle, broadly rounded and slightly serrate laterally, upperside flattened in the middle, with dense transverse strigosity. Scutellum slightly pentagonal, almost quadrate, strongly punctate. Elytra 1.2 times as long as wide, narrowed posteriorly, with sharp humeral tubercle and regular rows of rather strong punctures, which are more or less confused basally; longitudinal ridges present, the two lateral ridges very distinct and well developed, other two only basally distinct and replaced by slightly convex interspaces behind the basal convexity. Femora each with a small tooth. Mid tibiae curved. Segment 1 of fore tarsi widened in the ♂. Aedeagus see Fig. 51. Body length 4.2–4.6 mm.

Diagnosis

*S. iriana* n. sp. is similar to *S. diversecostata* Pic, 1944 from Borneo in the sculpture of the elytra, but the latter species being twice as large, with a different colouration, and with rugosities on the elytra.

Remarks

The genus *Scelodonta* Westwood, 1837 includes about 70 species from the Oriental and Afrotropical regions, but only two species are known from Australia. *S. iriana* n. sp. is the first species of this genus recorded from New Guinea.

2.2.3 Tribe Typophorini

Genus *Cleorina* Lefèvre, 1885

Only five species of this genus were previously known from New Guinea (see JACOBY 1905, BRYANT 1950). While many Oriental species of this genus have a distinctly convex anterior margin of the propleura, the New Guinean species have this margin only slightly convex in small species, and almost straight in large species. Due to this character the latter species strongly resemble the genus *Basilepta*.

*Cleorina riedeli* **n. sp.**

Holotype (♀): Papua New Guinea, Southern Highland Prov., Tari-Koroba Hake, 1700–2000 m, 14.V.1998, leg. A. RIEDEL (SMNS).

Paratypes: Same data as holotype, 1 ♀ (LM). – Papua New Guinea, Morobe Prov., ca. 10 km S Garaina, Saureri, 1600–1800 m, 24.–25.III.1998, leg. A. RIEDEL (SMNS).

Etymology

This new species is named after its collector, Dr. ALEXANDER RIEDEL (Karlsruhe).

Description

Upperside metallic green, underside dark green, antennae black with the 4 basal segments fulvous, labrum piceous, palpi fulvous, femora dark metallic, tibiae and tarsi dark fulvous, abdominal tergites black.

Body moderately elongate. Head strongly punctate, especially on the clypeus, anterior margin arcuately emarginated. Proportions of antennal segments as 6-5-7-7-5-5-5-5-5-7, preapical segments about 1.6 times as long as wide, segments 3 and 4 thin, not less than 5 times as long as wide. Prothorax 1.6 times as wide as long, lateral margins barely angulate in the basal third, surface strongly punctate, with interspaces more or less as wide as diameter of punctures. Scutellum trapeziform with rounded apex, shining, with a few fine punctures. Elytra 1.2 times as long as wide, humerus moderately high, basal convexity well delimited, but not high, punctures in rows fine, more or less of same size, interspaces flat and much wider than punctures in rows, outermost interspace convex, reaching obliquely from humerus to the lateral margin. Propleura with large punctures, microsculptured. Metasternum densely punctate and pubescent laterally, almost smooth in the middle. Abdominal tergites slightly sclerotized. Femora untoothed. Body length 2.8–3.3 mm.

Diagnosis

This new species is similar to *C. viridissima* Jacoby, 1905, but differs in its fulvous tibiae and tarsi and the flat interspaces of the elytral rows.

*Cleorina pulchra* **n. sp.**
(Figs. 47, 96)

Holotype (♀): New Guinea, Irian Jaya, Iba, 1300 m, 7.–8.IV.1993, leg. A. Riedel (SMNS).

Paratypes: Same data as holotype, 1 ♀ (LM). – New Guinea, Irian Jaya, 10 km N Faktak, Rankendak II, 9.VII.1996, leg. P. Schüle & P. Stüben, 1 ♀ (SMNS).

Description

Metallic green including abdominal tergites and apex of pygidium, prothorax often golden green; antennae black with the 2 or 3 basal segments fulvous, labrum and palpi fulvous; elytra purple with narrow sutural stripe, wide lateral margin and apical slope green; all femora red with narrow green apical part.

Body robust, wide. Clypeus with straight anterior margin, with rough sculpture, mostly transversely rugose. Frons and vertex finely and sparsely punctate, with longitudinal groove in the middle. Proportions of antennal segments as 8-3-6-8-8-8-7-7-7-6-7, preapical segments about twice as long as wide. Prothorax 1.6 times as wide as long, lateral margins slightly angulate in their basal third, surface shining, with rather large, not dense punctures. Scutellum trapeziform with rounded apex, with a few punctures and very thin microsculpture. Elytra 1.1–1.2 times as long as wide, humeral tubercle high, basal convexity low, delimited posteriorly by a shallow impression, punctures in rows moderately large, smaller on apical slope and especially on basal convexity, interspaces of rows wide and flat, humeral tubercle prolonged forming an obtuse ridge on the anterior third of the elytra. Propleura nearly impunctate, shining. Metasternum not pubescent, with longitudinal and partly oblique rugosity laterally, in the middle nearly impunctate. Abdominal tergites sclerotized, very hard. Mid and hind femora with a very small tooth on underside. Spermatheca see Fig. 47. Body length 5.1–5.5 mm.

Diagnosis

This new species is similar to *C. splendida* Bryant, 1950 in having metallic green abdominal tergites and same sculpture of head and metasternum; however, it is clearly distinguished by its larger size, impunctate propleura and a different colouration of antennae, elytra and legs.

*Cleorina flavipes* **n. sp.**
(Figs. 48, 97)

Holotype (♀): Papua New Guinea, Vanimo, Denake-Range, 28.–29.X.1992, 500 m, leg. A. Riedel (SMNS).

Paratype: New Guinea, Irian Jaya, Sentani, Cyclops Mountains, 950–1450 m, 3.X.1992, leg. A. Riedel, 1 ♀ (LM).

Description

Head, prothorax and scutellum black with a slight metallic tint, antennae black with the 5–6 basal segments fulvous, labrum and palpi fulvous, elytra violaceous blue with humerus greenish blue and sutural area sometimes reddish cupreous, underside dark metallic green, abdominal tergites fulvous, legs entirely red fulvous.

Body robust. Clypeus slightly concave on its anterior margin, with rather large and moderately dense punctures, frons and vertex with moderately strong sparse punctures and the trace of a groove in the middle. Proportions of antennal segments as 6-3-3-4-4-4-5-5-5-5-6, preapical segments about 1.7 times as long as wide. Prothorax 1.5 times as wide as long, lateral margins barely angulate in their basal third, surface finely and sparsely punctate. Scutellum triangular with rounded apex, shining and impunctate. Elytra 1.1 times as long as wide, humeral tubercle not high, basal convexity very weak, punctures in rows fine, interspaces wide and flat, shining, impunctate. Propleura sparsely punctate, without microsculpture. Metasternum pubescent, finely but distinctly punctate laterally, almost impunctate in the middle. Abdominal ter-

gites sclerotized, hard. Femora untoothed. Spermatheca see Fig. 48. Body length 4.4–5.3 mm.

### Diagnosis

This new species is similar to *C. pulchra* Bryant, 1950, but differs in its abdominal tergites and legs which are entirely fulvous.

## *Cleorina femorata* **n. sp.**
(Figs. 49, 54, 95)

Holotype (♂): New Guinea, Irian Jaya, Jayawijaya, Yalmabi, 1200–1400 m, 8.IX.1996, leg. A. Riedel (SMNS).

Paratypes: New Guinea, Irian Jaya, Jayawijaya, Yalmabi-Samboka, 200–650 m, 9.X.1996, leg. A. Riedel, 4 ex. (SMNS, LM). – New Guinea, Irian Jaya, Jayawijaya, Dekai, Brazza river, ca. 100 m, 21.–22.VI.1994, leg. A. Riedel, 2 ex. (SMNS). – New Guinea, Irian Jaya, Jayawijaya, Samboka, 200 m, 10.–14.X.1996, leg. A. Riedel, 3 ex. (SMNS). – New Guinea, Irian Jaya, Jayawijaya, Bommela, 1700–1950 m, 4.X.1996, leg. A. Riedel, 1 ex. (SMNS). – New Guinea, Irian Jaya, Jayawijaya, Yalmabi, 1200–1400 m, 8.IX.1996, leg. A. Riedel, 1 ex. (SMNS). – New Guinea, Irian Jaya, Jayawijaya, Bommela, 1750 m, 30.VIII.–1.IX.1992, leg. A. Riedel, 1 ex. (SMNS).

### Description

Dark metallic green, antennae black with the 4–5 basal segments fulvous, maxillar palpi fulvous with black apical segments, elytra violaceous blue or the area near suture more or less green, all femora red, abdominal tergites fulvous, apex of pygidium blackish.

Body robust. Clypeus with a slightly concave anterior margin, microsculptured, with rather large and moderately dense punctures. Frons and vertex very finely microsculptured, with small and sparse punctures, which are more distinct laterally. Proportions of antennal segments as 7-4-3-4-5-5-6-6-6-6-9, preapical segments about 1.7 times as long as wide. Prothorax 1.3 times as wide as long, lateral margins slightly angulate in their basal third, surface shining, finely and sparsely punctate. Scutellum triangular with rounded apex, finely microsculptured, impunctate. Elytra 1.1 times as long as wide, humeral tubercle rather high, basal convexity very weak or indistinct, punctures in rows fine, especially on base and apical slope, interspaces wide and flat, shining and impunctate. Propleura microsculptured and punctate. Metasternum pubescent, finely but distinctly punctate. Abdominal tergites sclerotized, hard. Femora untoothed. Aedeagus see Fig. 54. Spermatheca see Fig. 40. Body length 4.7–6.2 mm.

### Diagnosis

This new species differs differs from *C. flavipes* n. sp. in its metallic green tibiae and tarsi.

## *Cleorina schawalleri* **n. sp.**
(Figs. 55, 98)

Holotype (♂): Papua New Guinea, Morobe Prov., Lakekamu-Becken [= Lakekamu Basin], Tekadu, 300–400 m, 28.II.–6.III.1998, leg. A. Riedel (SMNS).

Paratypes: Same data as holotype, 2 ♀♀ (SMNS, LM).

### Etymology

This nice species is dedicated to my dear friend Dr. Wolfgang Schawaller (Stuttgart).

### Description

Prothorax and scutellum black with a very slight metallic luster, labrum and palpi fulvous, antennae black with the 5–6 basal segments fulvous, elytra and underside metallic blue or greenish blue, elytra sometimes violaceous in the anterior half except the humerus, abdominal tergites fulvous, legs greenish blue with the hind femora except a narrow apical part red.

Body robust. Clypeus slightly concave on its anterior margin, densely punctate laterally, almost smooth in the middle, without microsculpture, frons and vertex finely and sparsely punctate. Proportions of antennal segments as 6-3-3-5-5-5-5-5-5-5-7, preapical segments about 1.4–1.5 times as long as wide. Prothorax 1.2 times as wide as long, lateral margins barely angulate behind the middle, surface finely and sparsely punctate. Scutellum parallel-sided with rounded apex, microsculptured, with a few punctures. Elytra 1.1 times as long as wide, humeral tubercle high, basal convexity very weak or indistinct, punctures in rows fine, interspaces wide, flat, impunctate. Propleura finely microsculptured, with sparse large punctures. Metasternum microsculptured, very finely and sparsely punctate, almost smooth in the middle. Abdominal tergites sclerotized, hard. Femora untoothed. Aedeagus see Fig. 55. Spermatheca as in *C. femorata* n. sp. (Fig. 49). Body length 5.3 mm in ♂, 5.7–5.8 mm in ♀.

### Diagnosis

This new species is similar to *C. femorata* n. sp., but the legs are metallic green, and only the hind femora red.

## *Cleorina bryanti* **n. sp.**
(Figs. 56, 91)

Holotype (♂): Papua New Guinea, Morobe Prov., Aseki Oiwa, 1600–1700 m, 11.–12.III.1998, leg. A. Riedel (SMNS).

Paratypes: Same data as holotype, 4 ex. (SMNS).

### Etymology

This new species is dedicated to the late Dr. Gilbert Ernest Bryant (1878–1965), who described numerous new Coleoptera from New Guinea.

Description

Metallic green or bluish green, antennae black with the 3 or 4 basal segments fulvous, labrum fulvous, maxillar palpi fulvous with blackish apical segment, abdominal tergites dark piceous.

Body robust. Clypeus slightly concave on its anterior margin, head rather densely punctate, vertex with short groove in the middle. Proportions of antennal segments as 5-3-3-4-4-5-5-5-5-5-6, preapical segments about 1.7 times as long as wide. Prothorax 1.4 times as wide as long, lateral margins barely angulate behind the middle, surface with sparse and small punctures, shining. Scutellum triangular with rounded apex, microsculptured, with a few punctures. Elytra 1.1 times as long as wide, humeral tubercle rather high, basal convexity very slight, punctures in rows fine, more or less equal in size, interspaces wide, flat, shining and impunctate. Propleura finely microsculptured, with dense, deep punctures. Metasternum with very fine and extremely sparse punctures, bearing short hairs, microsculptured laterally, with very thin transverse lines in the middle. Abdominal tergites sclerotized, hard. Femora untoothed. Aedeagus with longitudinal impression on underside (Fig. 56). Spermatheca as in *C. femorata* n. sp. (Fig. 49). Body length 4.4–5.0 mm.

Diagnosis

This new species is similar to *C. splendida* Bryant, 1950, but is distinguished by its piceous abdominal tergites, and its entirely metallic green or blue green legs.

*Cleorina hirticollis* Bryant, 1950
(Figs. 52, 92)

Material examined

Papua New Guinea, Mt. Tafa, 8500 ft., II.1934, leg. L. E. Cheesman, type (BMNH). – Papua New Guinea, Morobe Prov., Aseki Oiwa, Langama road, 1600–1700 m, 21.II.1998, leg. A. Riedel, 1 ex. (LM). – Papua New Guinea, Morobe Prov., ca. 10 km S Garaina, Saureri, 1400–1700 m, 20.III.1998, leg. A. Riedel (SMNS). – Papua New Guinea, Morobe Prov., Aseki Oiwa, 1600–1700 m, 11.–12.III.1998, leg. A. Riedel, 1 ex. (SMNS). – New Guinea, Irian Jaya, Jayawijaya, Bommela, 1700 m, 4.X.1996, leg. A. Riedel, 3 ex. (SMNS). – New Guinea, Irian Jaya, Jayawijaya, Langda-Bommela, Hydranten Mts., 2650–2850 m, 29.VIII.1992, leg. A. Riedel, 1 ex. (SMNS). – New Guinea, Irian Jaya, Anggi, Iray, Gunung Disbehey, 1900–2100 m, 19.–20.III.1993, leg. A. Riedel, 8 ex. (7 SMNS, 1 LM).

*Cleorina papuana* Bryant, 1950

This species was originally described from Papua (Mafulu, Diene). I did not see material, but the species is included in the key to *Cleorina* (see below).

*Cleorina semipurpurea* Jacoby, 1905

Material examined

Papua New Guinea, Ighibirei, VII.–VIII.1890, leg. Loria, type (BMNH).

*Cleorina viridissima* Jacoby, 1905
(Figs. 53, 93)

Material examined

New Guinea, Irian Jaya, Jayawijaya, Bommela, 1700 m, 4.X.1996, leg. A. Riedel, 1 ex. (SMNS). – New Guinea, Irian Jaya, Jayawijaya, Borme-Omban, 1000–1300 m, 3.IX.1993, leg. A. Riedel, 9 ex. (8 SMNS, 1 LM). – New Guinea, Irian Jaya, Jayawijaya, Borme, 1000–1300 m, 13.–18.VIII.1992, leg. A. Riedel, 1 ex. (SMNS). – New Guinea, Irian Jaya, Japen Isl., Kontiunai, 600–700 m, 25.XII.2000, leg. A. Riedel, 5 ex. (4 SMNS, 1 LM). – New Guinea, Irian Jaya, Japen Isl., Kontiunai, 600–700 m, 23.XII.2000, leg. A. Riedel, 4 ex. (SMNS). – New Guinea, Irian Jaya, Iba, 1300 m, 7.–8.IV.1993, leg. A. Riedel, 1 ex. (LM). – New Guinea, Irian Jaya, Jayapura, Sentani, Cyclops Mountains, 400–800 m, 7. VIII.1992, leg. A. Riedel, 1 ex. (SMNS). – New Guinea, Irian Jaya, Sorong Prov., Salawatti Isl., SP-2, Waijan, 50–100 m, 23.–25.X.1996, leg. A. Riedel, 1 ex. (SMNS). – New Guinea, Irian Jaya, Sorong Prov., Salawatti Isl., Solol, 0–350 m, 6.–7.XI.1996, leg. A. Riedel, 1 ex. (SMNS).

Remark

The species was originally described from Ighibirei (Southern Papua New Guinea).

*Cleorina splendida* Bryant, 1950

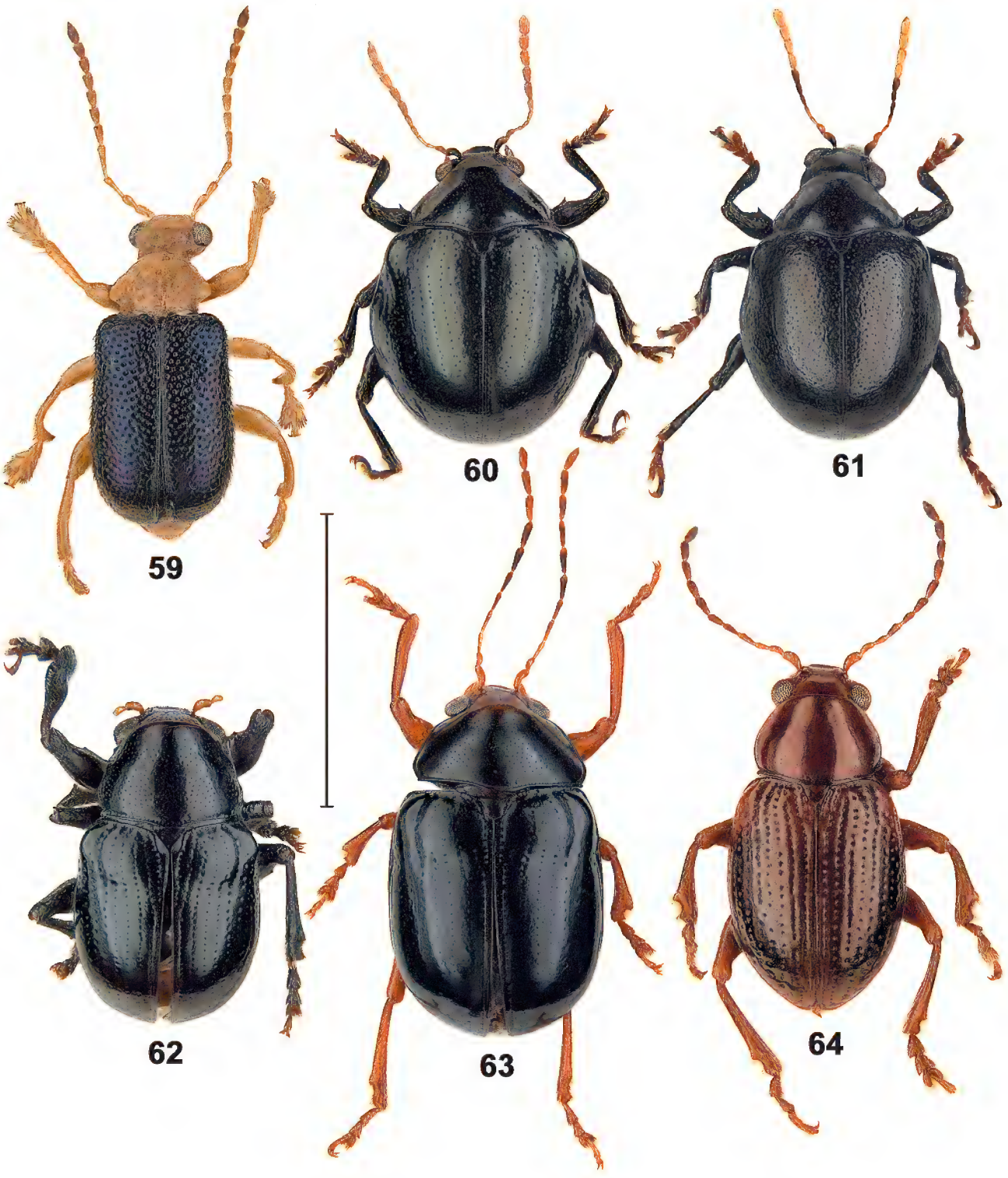
Material examined

Papua New Guinea, Kokoda, 1700 ft., VI.1933, leg. L. E. Cheesman, type (BMNH).

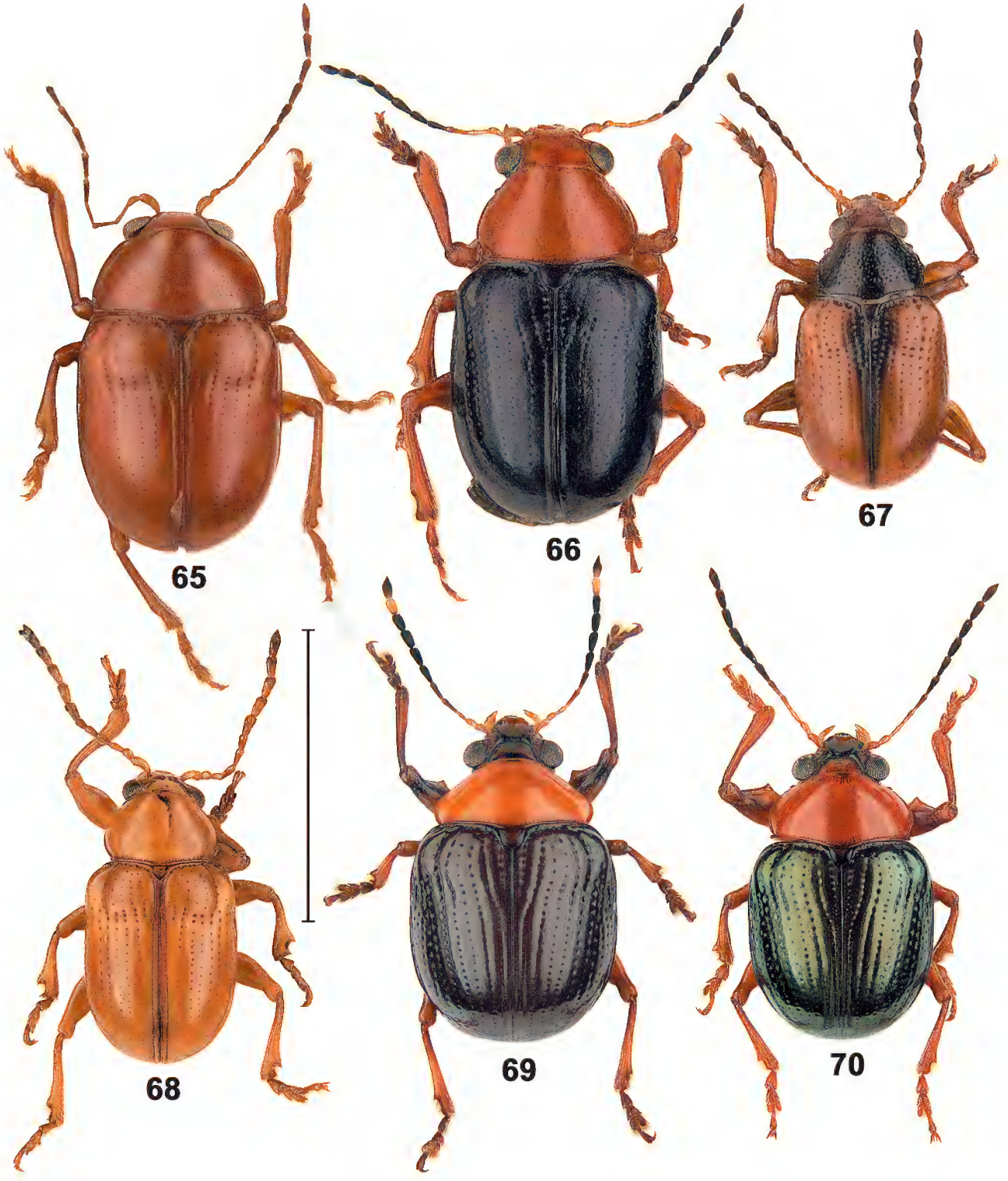
*Cleorina nigricornis* **n. sp.**
(Figs. 50, 57, 94)

Holotype (♂): New Guinea, Irian Jaya, Jayawijaya, Okloma-Emdoman, 1400–1700 m, 28.IX.1993, leg. A. Riedel (SMNS).

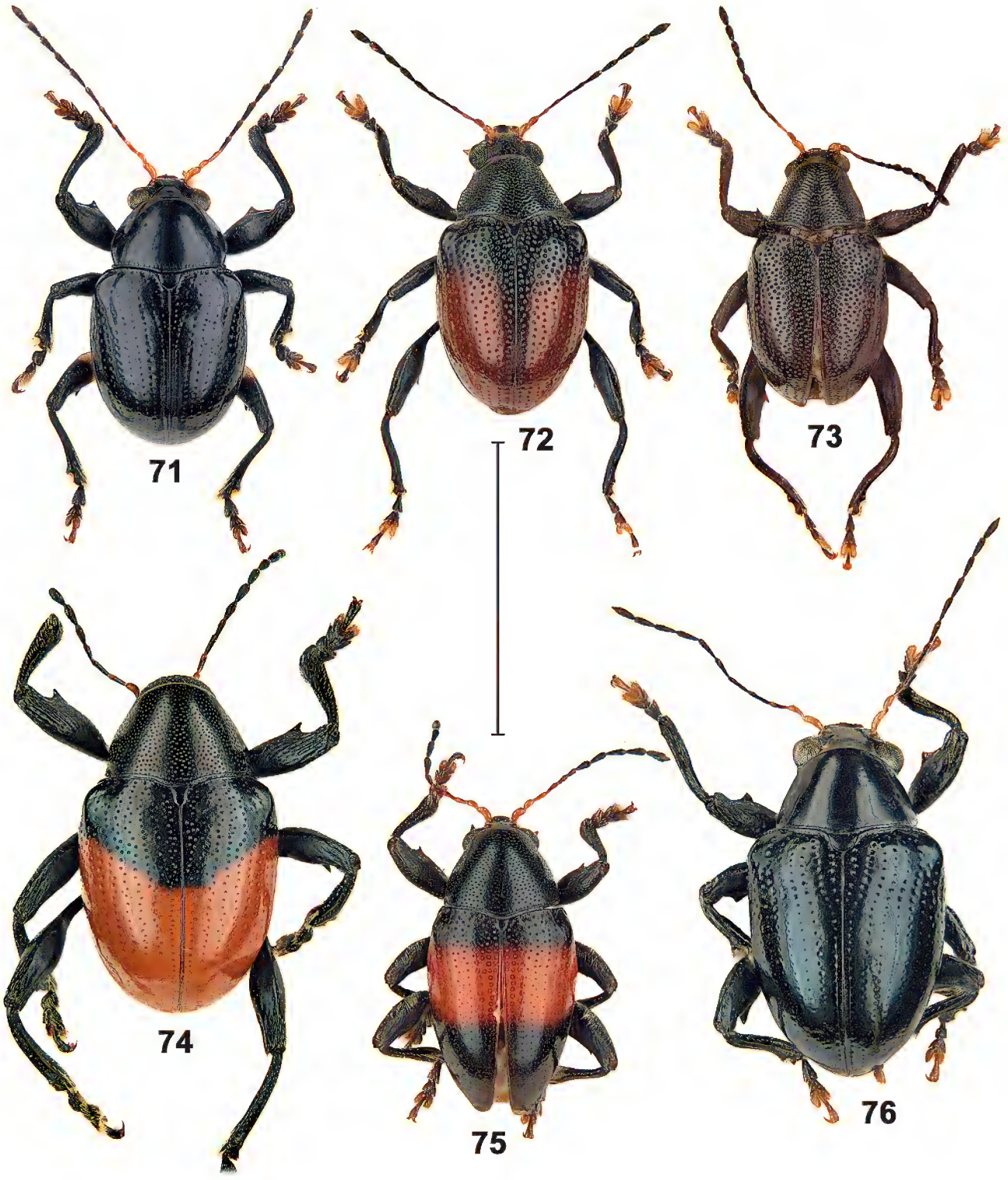
Paratypes: New Guinea, Irian Jaya, Jayawijaya, Mt. Goliath, 1700–1800 m, 6.X.1996, leg. A. Riedel, 1 ex. (SMNS). – New Guinea, Irian Jaya, Jayawijaya, Langda, 2100–2300 m, 27.–28.VIII.1992, leg. A. Riedel, 3 ex. (SMNS). – New Guinea, Irian Jaya, Jayawijaya, Bime, 1600–1900 m, 22.IX.1993, leg. A. Riedel, 1 ex. (SMNS). – New Guinea, Irian Jaya, Jayawijaya, Bommela, 1750 m, 30.VIII.–1.IX.1992, leg. A. Riedel, 1 ex. (SMNS). – New Guinea, Irian Jaya, Anggi, Tetaho Kosmena, 1400–1750 m, 26.–28.III.1993, leg. A. Riedel, 1 ex. (LM). – New Guinea, Irian Jaya, Jayawijaya, Yalmabi, 1200–1400 m, 8.IX.1996, leg. A. Riedel, 1 ex. (LM). – New Guinea, Irian Jaya, Jayawijaya, Bommela, 1700 m, 4.X.1996, leg. A. Riedel, 19 ex. (SMNS).



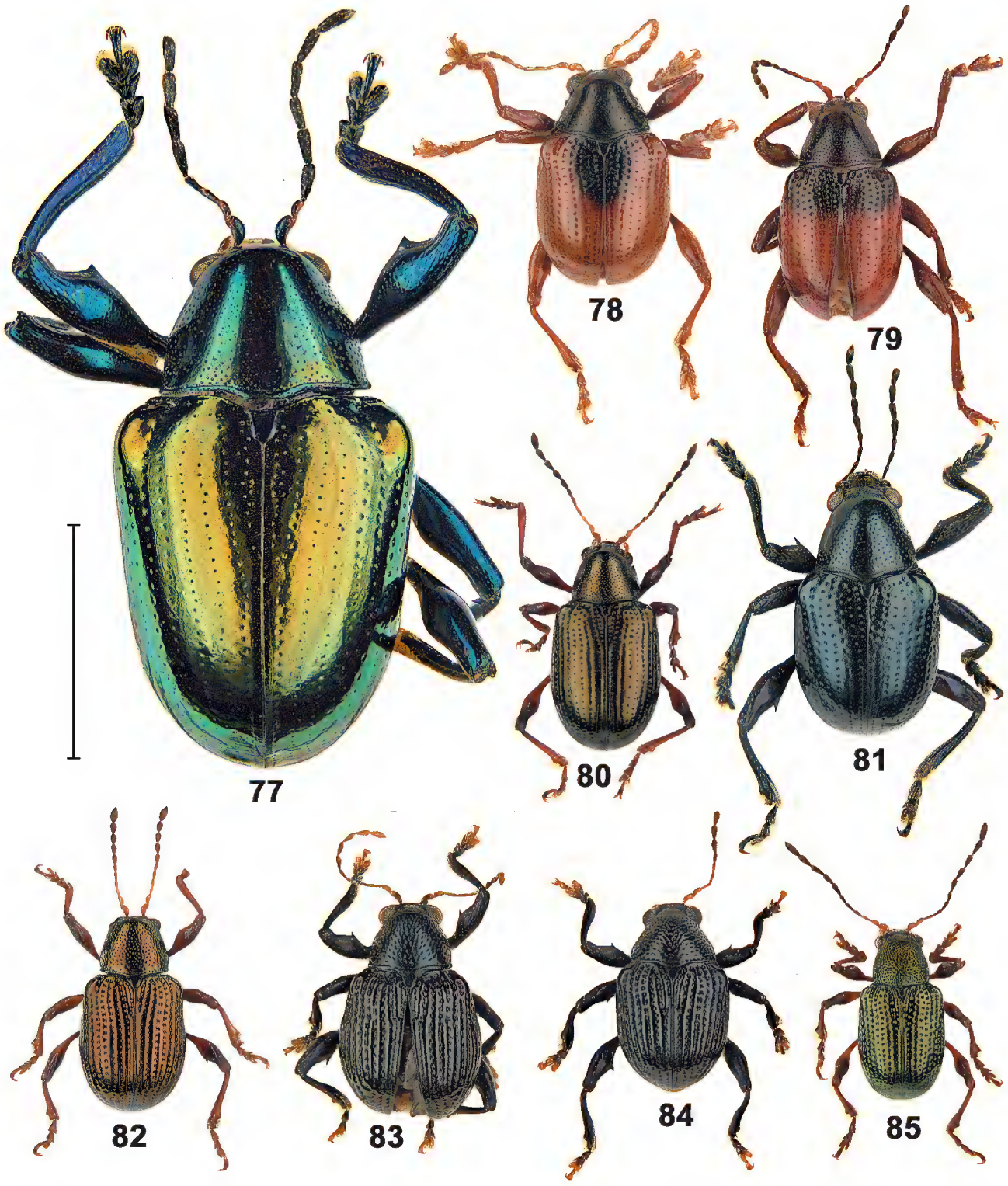

**Figs. 59–64.** *Zeugophora*, *Iviva*, and *Rhyparidella* spp., dorsal views. – **59**. *Zeugophora papuana* n. sp. **60**. *Iviva striata* n. sp. **61**. *I. antennata* n. sp. **62**. *Rhyparidella weisei* n. sp. **63**. *R. rufocapitis* n. sp. **64**. *R. ovipennis* n. sp. – Scale: 3 mm.



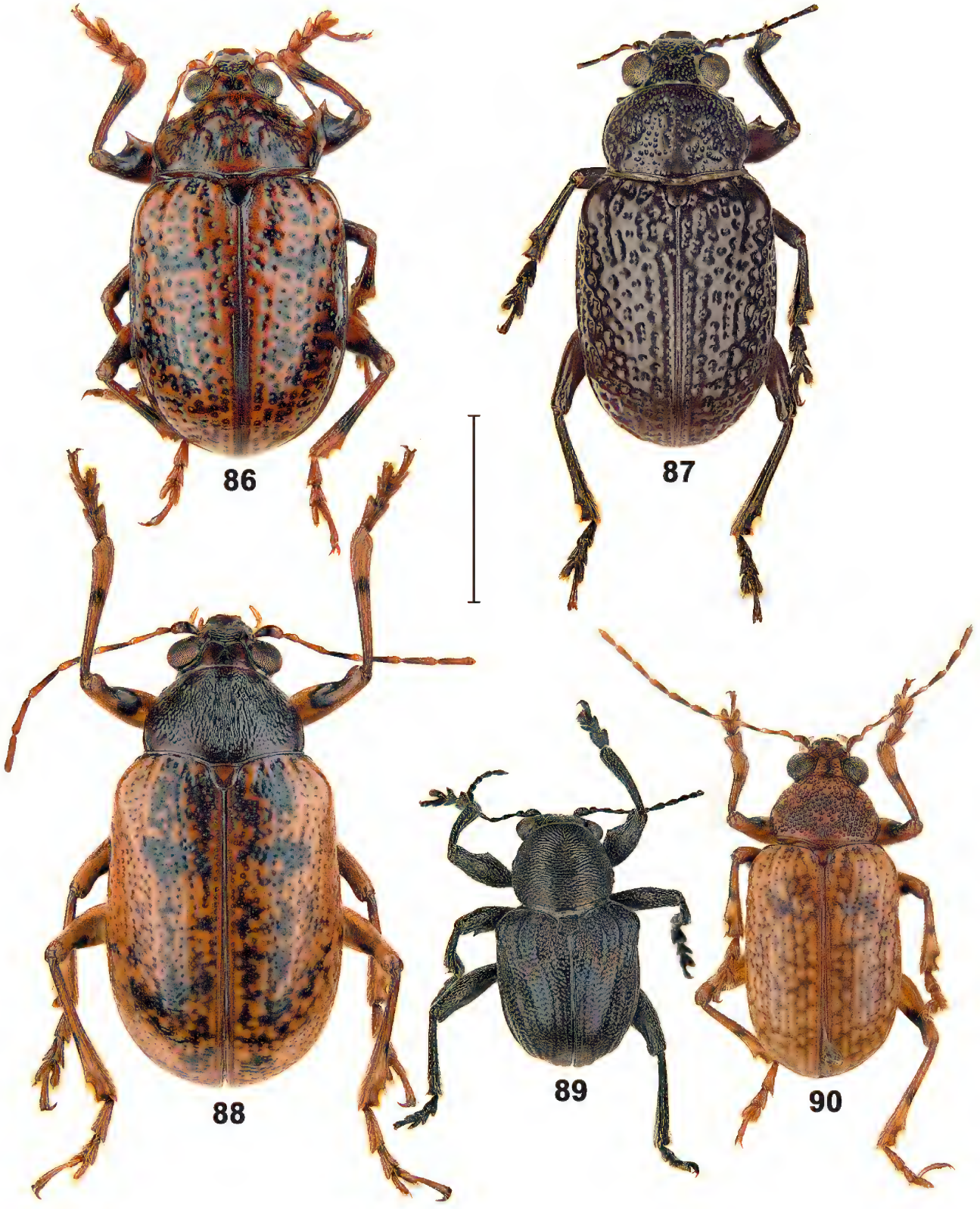

**Figs. 65–70.** *Rhyparidella* and *Phainodina* spp., dorsal views. – **65**. *Rhyparidella fulva* n. sp. **66**. *R. nigripennis* n. sp. **67**. *R. suturalis* n. sp. **68**. *R. riedeli* n. sp. **69**. *Phainodina antennalis* n. sp. **70**. *P. riedeli* n. sp. – Scale: 3 mm.



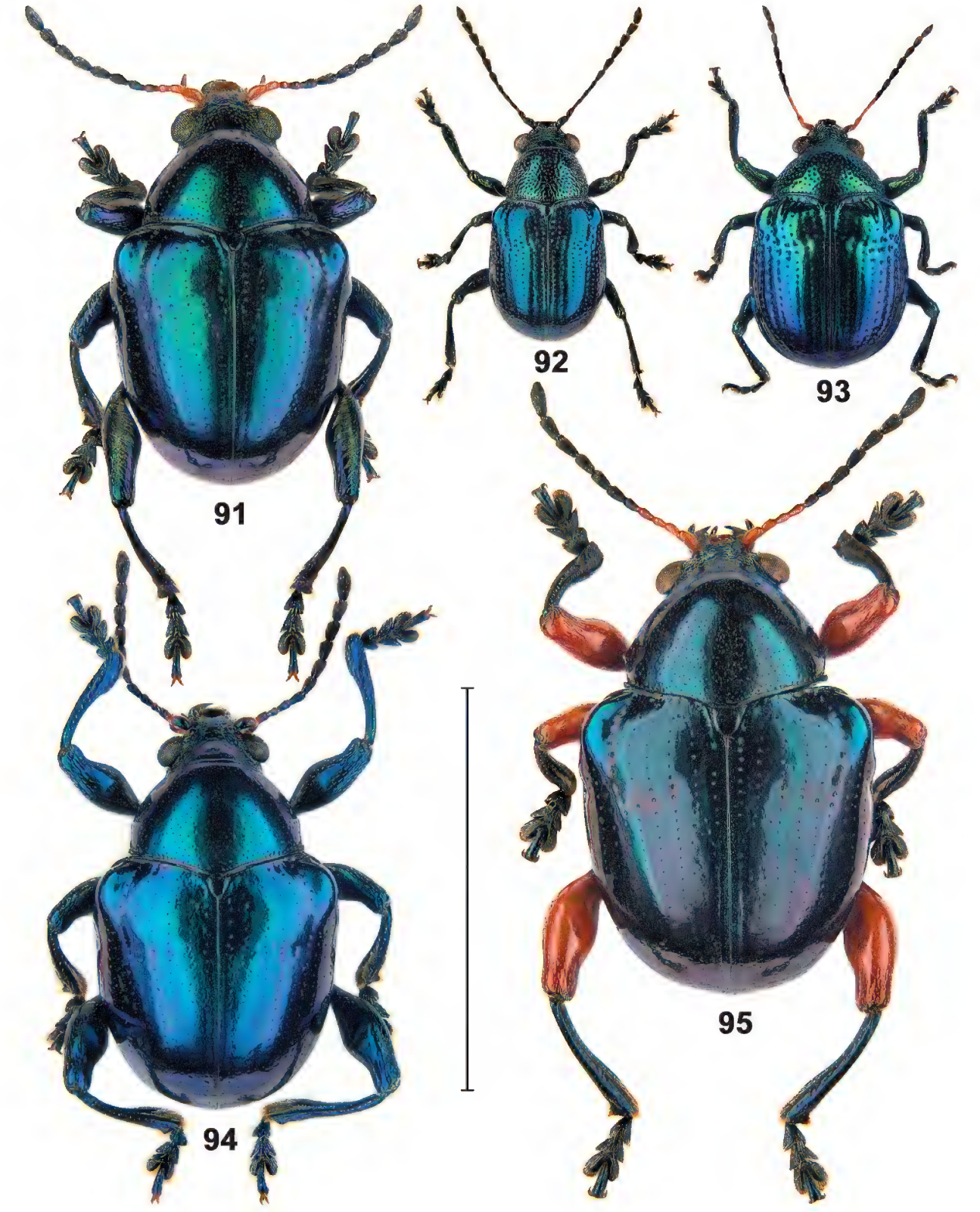

**Figs. 71–76.** *Phainodina* and *Stethotes* spp., dorsal views. – **71**. *Phainodina femorata* n. sp. **72**. *Stethotes riedeli* n. sp. **73**. *S. schawalleri* n. sp. **74**. *S. armata* n. sp. **75**. *S. papuana* n. sp. **76**. *S. laevicollis* n. sp. – Scale: 3 mm.



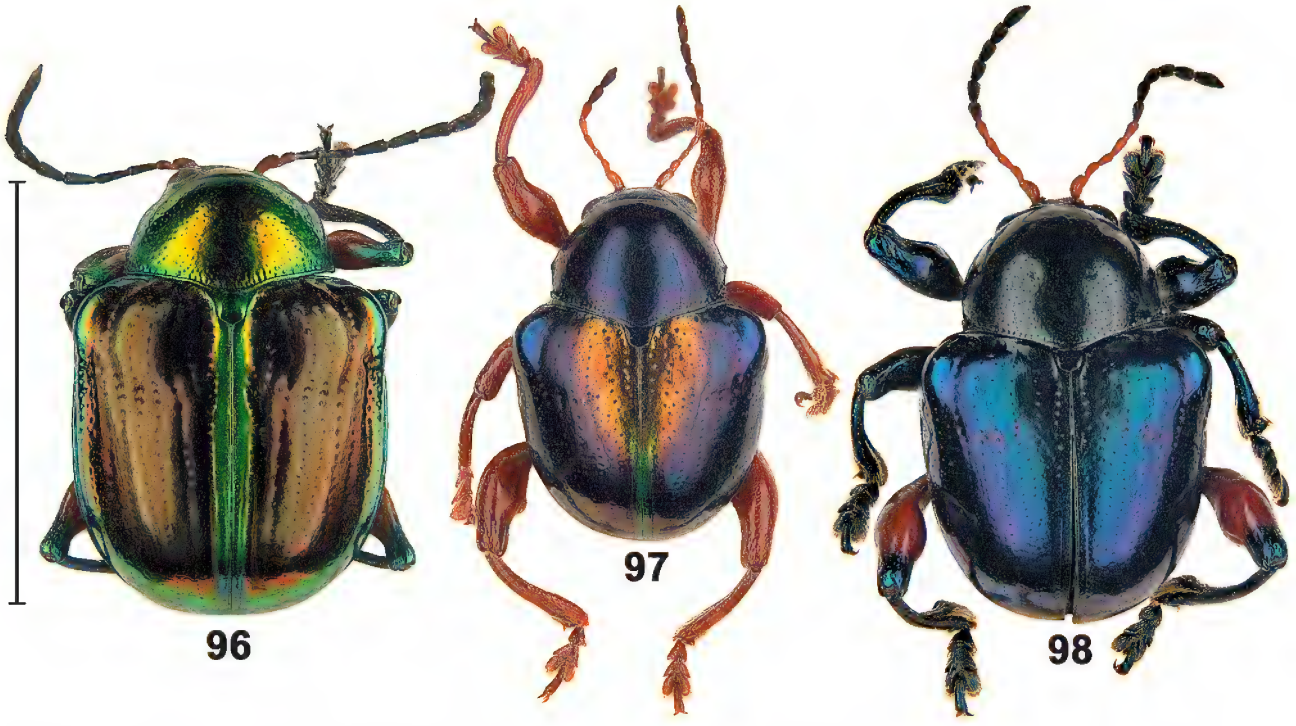

**Figs. 77–85.** *Stethotes* spp., dorsal views. – **77**. *S. viridissima* n. sp. **78**. *S. fulvicornis* n. sp. **79**. *S. rubripes* n. sp. **80**. *S. aenea* n. sp. **81**. *S. gressitti* n. sp. **82**. *S. costipennis* n. sp. **83**. *S. balyi* n. sp. **84**. *S. iriana* n. sp. **85**. *S. hirticollis* n. sp. – Scale: 3 mm.




**Figs. 86–90.** *Gressittella*, *Gressittana*, *Scelodonta*, and *Rhyparida* spp., dorsal views. – **86**. *Gressittella riedeli* n. sp. **87**. *Gressittella obscura* n. sp. **88**. *Gressittana sculpturata* (Gressitt). **89**. *Scelodonta iriana* n. sp. **90**. *Rhyparida goilalae* Gressitt. – Scale: 3 mm.




**Figs. 91–95.** *Cleorina* spp., dorsal views. – **91**. *C. bryanti* n. sp. **92**. *C. hirticollis* Bryant. **93**. *C. viridissima* Jacoby. **94**. *C. nigricornis* n. sp. **95**. *C. femorata* n. sp. – Scale: 5 mm.




**Figs. 96–98.** *Cleorina* spp., dorsal views. – **96**. *C. pulchra* n. sp. **97**. *C. flavipes* n. sp. **98**. *C. schawalleri* n. sp. – Scale: 5 mm.

## Description

Metallic blue or violaceous blue, darker on underside, antennae black with the 2 or 3 basal segments fulvous on underside, labrum black, maxillar palpi fulvous with black apical segment, abdominal tergites piceous to black.

Body robust. Head finely and indistinctly punctate, anterior margin of clypeus almost straight. Proportions of antennal segments as 6-3-3-4-4-4-4-4-5-5-6, preapical segments about 1.6 times as long as wide. Prothorax 1.6 times as wide as long, lateral margins without distinct angulation behind the middle, surface finely and not densely punctate. Scutellum triangular with rounded apex, shining and impunctate. Elytra 1.15 times as long as wide, humeral tubercle high, basal convexity very weak, almost indistinct, punctures in rows very fine, interspaces wide, flat and shining. Propleura strongly punctate, without microsculpture. Metasternum laterally microsculptured and very finely punctate, impunctate in the middle, with very thin transverse strigosity. Femora untoothed. Aedeagus (Fig. 57) without any impression on underside. Spermatheca see Fig. 50. Body length 4.8–5.8 mm.

## Diagnosis

This new species is similar to *C. bryanti* n. sp., but differs in having a black labrum, and the aedeagus without an impression on its underside.

## Key to the New Guinean species of *Cleorina*

**1** Prothorax pubescent (Fig. 92). – Upperside greenish aeneous or purple, prothorax often with a colouration different from the elytra. Antennae black with the basal segments more or less fulvous, at least on underside. Legs and abdominal tergites black. Prothorax strongly and densely punctate, especially laterally. Basal convexity of the elytra very distinct, nearly impunctate. Propleura microsculptured, with sparse large punctures. Metasternum densely punctate, especially laterally. Apex of aedeagus truncate (Fig. 52). Body length 2.1–3.1 mm. . . . . ***hirticollis*** Bryant

– Prothorax not pubescent. . . . . **2**

**2** Body length at most 3.3 mm. Anterior margin of propleura moderately convex. . . . . **3**

– Body length 4.4–6.2 mm. Anterior margin of propleura very slightly convex, almost straight. – Upperside usually not strongly punctate, basal convexity of elytra weak or indistinct. . . . . **6**

**3** Antennae pale flavous with segments 6–8 fuscous. Head and prothorax black, nitid, impunctate. Elytra without distinct basal convexity. Fore femora dilated, with a tooth on underside, mid and hind femora untoothed. Body length 3.0 mm. – Elytra dark metallic green or purple. Legs black with fulvous tarsi, underside black. . . . . ***C. papuana*** Bryant

– Antennae black with fulvous basal segments. Head and prothorax metallic, strongly punctate. Elytra with distinct basal convexity. Fore femora neither dilated nor toothed. Propleura strongly punctate. . . . . **4**

**4** Metasternum longitudinally strigose, especially laterally. Vertex longitudinally strigose. – Prothorax greenish blue, elytra violaceous (not purplish, as stated in original descrip-

tion), underside bluish black with the apical abdominal sternite dark fulvous. Body length 2.9 mm (not 2.5 mm, as stated in original description). Only known from the ♀ holotype from Ighibirei. . . . . ***C. semipurpurea*** Jacoby

– Metasternum and vertex not longitudinally strigose. . . . . **5**

**5** Bright metallic green, underside and legs dark metallic (Fig. 93). Prothorax strongly and densely punctate, especially laterally, interspaces mostly narrower than diameter of punctures, rugose laterally. Elytra strongly punctate, interspaces more or less convex, often costate laterally, interspaces at most as wide as or often narrower than diameter of punctures. Anterior margin of clypeus quadrangularly in ♂. Aedeagus (Fig. 53) with rounded apex, without impressions on underside. Body length 2.3–3.0 mm. . . . . ***C. viridissima*** Jacoby

– Metallic green, darker on underside, tibiae and tarsi dark fulvous. Prothorax with interspaces as wide as diameter of punctures. Elytra finely punctate, interspaces flat and much wider than diameter of punctures, the outermost interspace convex and reaching obliquely from humerus to lateral margin. ♂ unknown. Body length 2.8–3.3 mm. . . . . ***C. riedeli* n. sp.**

**6** Abdominal tergites metallic green (Fig. 96). Metasternum laterally longitudinally and partly obliquely strigose. Basal convexity of elytra well developed. Clypeus roughly punctate and at least anteriorly transversely rugose. . . . . **7**

– Abdominal tergites fulvous or piceous to black. Metasternum laterally punctate, without strigosity. Basal convexity of elytra weak or indistinct. Clypeus without transverse rugosity. . . . . **8**

**7** Femora red with narrow apical part metallic green. Antennae with the 2 or 3 basal segments fulvous. Propleura impunctate. Elytra purple with a narrow sutural stripe, the wide lateral margin and the apical slope metallic green (Fig. 96). Body length 5.1–5.5 mm. . . . . ***C. pulchra* n. sp.**

– Femora metallic green, fore and mid femora more or less dark red on underside. Antennae with the 5 basal segments fulvous. Propleura with punctures and wrinkles. Elytra violaceous blue, narrow sutural stripe metallic green, humerus greenish blue, basal half between shoulders and suture deep reddish copper. Body length 4.4 mm (not 4 mm, as stated in original description). Only known from the ♀ holotype from Papua (Kokoda). . . . . ***C. splendida*** Bryant

**8** Abdominal tergites fulvous. . . . . **9**

– Abdominal tergites piceous to black. . . . . **13**

**9** Legs entirely fulvous (Fig. 97). – Head and prothorax black, elytra metallic, the 5 or 6 basal antennal segments, labrum and palpi fulvous. Body length 4.4–5.3 mm. . . . . ***C. flavipes* n. sp.**

– Legs not entirely fulvous. . . . . **10**

**10** Femora at least partly red. . . . . **11**

– Femora entirely metallic blue. – Head and prothorax dark cupreous, elytra blue with large basal triangle golden cupreous, antennae black with the 4 basal segments fulvous, labrum and palpi fulvous. Body length 5.0 mm. Known only from 1 ♀ from Papua New Guinea (Mianmin, 700–1100 m, 20.V.1998, leg. A. Riedel) [possibly a valid species, but the material is not sufficient for a description]. . . . . ***C.* sp. B**

**11** All femora entirely red (Fig. 95). – Body dark metallic green with violaceous blue elytra, or the area near the suture more or less green. Labrum fulvous, maxillar palpi fulvous with black apical segment. Aedeagus see Fig. 54. Spermatheca see Fig. 49. Body length 4.7–6.2 mm. . . . ***C. femorata* n. sp.**

– Only hind femora red with metallic green apices. . . . . **12**

**12** Head and prothorax black with a very weak luster, elytra blue or greenish blue, sometimes violaceous in the anterior half (Fig. 98). Metasternum very finely punctate laterally. Aedeagus see Fig. 55. Body length 5.3–5.8 mm. . . . . ***C. schawalleri* n. sp.**

– Head cupreous green, prothorax blackish green, elytra blue with a green humerus and a coppery red basal half between the humerus and the suture. Metasternum stronger punctate laterally. Aedeagus mostly the same as in the preceding species. Body length 5.7 mm. – Only known from 1 ♂ from Irian Jaya (Emdoman, 1200 m, 13.IX.1992, leg. A. Riedel) [possibly only a colour form of *C. schawalleri* n. sp.]. . . . . ***C.* sp. A**

**13** Hind femora red with metallic green apices. Body metallic green or blue, labrum fulvous, maxillar palpi fulvous with black apical segment, antennae black with a few basal segments fulvous on underside. – Body length 4.5–4.8 mm. Known only from 2 ♀♀ from Irian Jaya (Bime, 1600–1900 m, 22.IX.1993, leg. A. Riedel; Emdoman, 1200 m, 13.IX.1992, leg. A. Riedel) [possibly a valid species, but there is not enough material for a description]. . . . . ***C.* sp. C**

– All femora metallic green or blue. Body entirely metallic blue or green. . . . . **14**

**14** Antennae black with the 3 or 4 basal segments fulvous (Fig. 91). Labrum fulvous. – Aedeagus with a longitudinal impression on underside (Fig. 56). Body length 4.9–5.0 mm. . . . . ***C. bryanti* n. sp.**

– Antennae black, the 2 or 3 basal segments more or less fulvous on underside. Labrum black, at least in its apical half. . . . . **15**

**15** Aedeagus without any impressions on underside, slightly widened near its base (Fig. 57). Body length 4.9–5.0 mm (Fig. 94). – Spermatheca see Fig. 50. . . . ***C. nigricornis* n. sp.**

– Aedeagus with a triangular impression on its underside near the base and more widened in this area (Fig. 58). Body length 4.8 mm. – Irian Jaya (Bommela, 1750–2100 m, 1.IX.1992, leg. A. Riedel) [very possibly only a form of the preceding species]. . . . . ***C.* sp. D**

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# Resolving the *Cyathea caracasana* complex (Polypodiopsida: Cyatheaceae)

Marcus Lehnert

Abstract

In the course of studies on Neotropical tree ferns, several changes in the circumscription of species in the *Cyathea caracasana* complex have to be made. Focusing on the petiolar indument and field observations as distinguishing characters, the following groups of species are separated: *Cyathea caracasana* (Klotzsch) Domin and *C. crenata* Sodiro from mid elevations from the northern Andes and the Caribbean; *Cyathea carolihenrici* Lehnert, *C. plicata* Lehnert, and *C. meridensis* H. Karst. from the northern and central Andes at mid elevations, the latter species in three geographically and ecologically separated varieties (two of them, var. *nana* and var. *obtecta*, are newly described); *Cyathea squamipes* H. Karst., *C. catacampta* Alston, and *C. lindeniana* H. Karst. occurring in the Andes at mid to high elevations. Species allied to *Cyathea patens* H. Karst. are restricted to high elevations and show a tendency towards forming local morphospecies. This group includes *C. patens* H. Karst., *C. brachypoda* Sodiro, *C. frondosa* H. Karst., and *C. parvifolia* Sodiro (syn. *C. brevistipes* R. C. Moran). *Cyathea maxonii* Underw. ex Maxon from Central America and *C. dissoluta* Baker ex Jenm. from Jamaica are of uncertain affinity. *Cyathea herzogii* Rosenst., formerly treated as synonym of *C. caracasana* s. l. by R. M. Tryon, represents a valid species belonging to the *C. fulva* group. Putative relationships are discussed, but more studies on the ecological and molecular level are needed in order to elucidate the relationships among and between the recognized groups.

Keywords: Andes, *Cyathea*, *C. caracasana* var. *boliviensis*, hybrids, Neotropics, scaly tree ferns, scurf, South America.

Zusammenfassung

Im Zuge von Studien an neotropischen Baumfarnen werden die Arten des *Cyathea caracasana*-Komplexes neu definiert. Basierend auf dem Wedelstielindument und Feldbeobachtungen als Unterscheidungsmerkmalen werden folgende Artengruppen unterschieden: *Cyathea caracasana* (Klotzsch) Domin und *C. crenata* Sodiro aus mittleren Höhenlagen der nördlichen Anden und der Karibik; *Cyathea carolihenrici* Lehnert, *C. plicata* Lehnert und *C. meridensis* H. Karst. aus mittleren Höhenlagen der Anden, letztere Art in drei geografisch und ökologisch getrennten Varietäten (zwei davon, var. *nana* und var. *obtecta*, werden als neu beschrieben); *Cyathea squamipes* H. Karst., *C. catacampta* Alston und *C. lindeniana* H. Karst. in mittleren und höheren Lagen der nördlichen und zentralen Anden weit verbreitet. Die Arten aus der Verwandtschaft von *Cyathea patens* H. Karst. sind auf hohe Lagen beschränkt und zeigen eine Tendenz zur Bildung lokaler Morphospezies. Diese Gruppe umfasst *C. patens* H. Karst., *C. brachypoda* Sodiro, *C. frondosa* H. Karst. und *C. parvifolia* Sodiro (syn. *C. brevistipes* R. C. Moran). Die verwandtschaftlichen Beziehungen von *Cyathea maxonii* Underw. ex Maxon aus Zentralamerika und *C. dissoluta* Baker ex Jenm. aus Jamaica sind unklar. *Cyathea herzogii* Rosenst., nach R. M. Tryons Konzept aus der Synonymie von *C. caracasana* s. l., repräsentiert eine eigenständige Art aus der *C. fulva*-Gruppe. Mögliche Verwandtschaftverhältnisse werden diskutiert, aber weitere Studien auf ökologischer und molekularer Ebene sind notwendig, um die wahren Beziehungen zwischen und innerhalb der hier anerkannten Gruppen zu ergründen.

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## 1 Introduction

The scaly tree ferns (Cyatheaceae) comprise ca. 600 species with a pantropical and southern temperate distribution (Kramer & Green 1990). Centers of diversity are Malesia, especially New Guinea (Holttum 1963), Madagascar (Janssen et al. 2008), Southeastern Brazil, the Caribbean, and the Andes (Tryon & Gastony 1975). In the Neotropics, the family is represented by ca. 200 species, the majority of them belonging to the genus *Cyathea* sensu Korall et al. (2007). With most of its members being large, showy plants, the scaly tree ferns have often catched the attention of plant collectors and researchers since the beginning of tropical botany. The number of collections and applied names is ample whereas the amount of material of most historic collections is lamentably pauper. During the 20th century, attempts were undertaken to resolve the hitherto confusing systematics of scaly tree ferns in comprehensive floral works (e. g., Stolze 1976, Kramer 1978, Smith 1985, Tryon 1986, Tryon & Stolze 1989) and revisions (Tryon 1970, 1971, 1976; Gastony, 1973; Stolze 1974; Windisch 1977, 1978; Barrington 1978; Conant 1983). Unfortunatley, Holttum (1963) and Holttum & Sen (1961) recognized only one genus *Cyathea* with several subgenera and sections based on his studies in the Old World, while Tryon (1970) focused on the New World and concluded that there are six distinguishable genera in the Cyatheaceae. A considerable number of species had to carry a different name in each of two rivaling generic systems.

Recent phylogentic studies on the tree fern alliance redefined the generic boundaries within the Cyatheaceae (Korall et al. 2006, 2007). Although this will help to settle the long-time conflict in the nomenclature, crucial problems in the delimitation of natural species remain. Some wide-ranging species are apparently quite variable in their morphology, which might reflect their ability to respond to different ecological conditions. There is also the possibility of active hybridization between species, which produces swarms of intermediate hybrids or may give rise to new sexually reproducing species (Conant 1975, 1990; Tryon 1976; Conant & Cooper-Driver 1980). This hampers establishing clear and comprehensible species concepts. The *C. caracasana* group as defined by Tryon (1976) is a paradigm for confusing taxa. Tryon (1976) united all Southamerican *Cyathea* with sphaeropteroid indusia, strongly bicolorous petiole scales with dark centers, and dark, long lasting scurf under this name and provided a system of varieties to structurize the intraspecific variability. However, increasing amounts of specimens and field observations in the years that followed showed that some of these varieties differ more strongly from each other than from species belonging to other of Tryon's (1976) groups. In the present account, I summarize my experiences with the *C. caracasana* complex that I gained during the past years. The circumscriptions of the species are based on field observations and extensive herbarium work. However, some species remain unresolved regarding variability of morphology, taxonomic status, and natural relationship. Therefore, this account should be considered as a preliminary guide and an encouragement for future studies.

### Abbreviations

| | |
|---|---|
| agg. | aggregat = species group |
| ex descr. | ex descriptione, based on text sources alone |
| n. l. | not located |
| n. v. | non vidi = not seen |
| n. var. | nova varietas = new variety |
| nom. nov. | nomen novum = new name (as a substitute) |
| nom. nud. | nomen nudum = bare name without taxonomic value |
| nom. superfl. | nomen superfluum = superfluous name |
| s. l. | sensu lato = in the wide sense |
| s. n. | sine numero = without number |

Extracted from Wagenitz (1996) and Stearn (2004). Herbarium acronyms follow Holmgren et al. (1990).

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I thank Michael Kessler (Z) and S. Robbert Gradstein (GOET) for scientific guidance during my Ph. D. thesis as well as Alexander Schmidt-Lebuhn (HAL) and Nicole Mandl (GOET) for shared experience and distress. During my field trips and travels, I have been supported by many colleagues, among whom I especially thank Stephan G. Beck, Ivan Jiménez, Edgar Gudiño, and Narel Paniagua (all LPB), Maria Teresa Murillo and Julio Betancur (COL), Asunción Cano (USM), Hugo Navarrete and Laura Salazar (QCA), Ana Moguel (GOET), Alison Paul (BM), Paulo Labiak (UPCB), Jefferson Prado (SP), Brent Mishler, Andy Murdock, and Ruth Kirkpatrick (UC), Layne Huiet (DUKE), Robbin Moran and Michael Sundue (NY). I am indebted to the directors and curators of AAU, B, BM, COL, CUZ, F, GH, GOET, HUT, K, LIL, LPB,

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## 2 Material and methods

I collected 330 fern specimens in Ecuador, Peru, and Bolivia, and documented their growth habit in word and photograph. Vouchers are mainly deposited at GOET, LPB, QCA, UC, and USM. A total of 720 numbers from tree fern collections were studied under the light microscope.

Terminology largely follows LELLINGER (2002), except for some special terms for tree fern characters that were coined by TRYON (1970, 1976). These are explained shortly here.

The petiole scales of all species treated here have a structurally differentated margin (i. e., the marginal cells are smaller and of a different orientation than those of the scale center; TRYON 1970, 1976). The scales may be of one color (concolorous) or two contrasting colors (bicolorous). In the latter case, the marginal color may be restricted to the differentiated margin (concordantly bicolorous) or may extend into the scale body (discordantly bicolorous).

The different types of indusia are used in keys to separate the tree ferns into manageable subsets. The common terms for character states are exindusiate (indusia lacking), hemitelioid (indusia not enclosing the receptacle completely; in *Cyathea* always scale-like), discoid (indusia disc-shaped), cyatheoid (indusia cup-shaped), and sphaeropteroid (indusia globose, completely closed). An umbo is an apical papilla where the indusial walls have joined in a sphaeropteroid indusium. The terms urceolate (urn-shaped) and subsphaeropteroid (closed except for a small apical orifice) describe conditions between cyatheoid and sphaeropteroid and are often exchangeable.

The variation of measurements given in the species descriptions refers to the maxima observed in the majority of specimens. Significant deviations based on single or few specimens are given in brackets.

The geographic sequence in the citation of specimens follows "A Guide for Contributors to Flora Neotropica, Appendix I" (http://www.nybg.org/files/fnai2.pdf).

## 3 Systematic treatment

### 3.1 General

Principally, the neotropical *Cyathea* species with globose (sphaeropteroid) indusia can be divided into two major groups based upon the type of petiolar and laminar indument. The first group contains the *Cyathea pallescens* (see LEHNERT 2008), *Cyathea divergens*, and *C. straminea* groups as well as *Cyathea caracasana* var. *chimborazensis* (Hook.) R. M. Tryon as defined by TRYON (1976). All species correspond in having generally long-lanceolate petiole scales that have dark colored (brown to blackish) bodies and white opaque margins, which may have dark teeth; *Cyathea atahuallpa* (R. M. Tryon) Lellinger, which has entirely white scales that lack dark teeth, is interpreted as the end of an evolutionary lineage, following the almost completely white, dark-toothed scales of *C. straminea* H. Karst. Its inclusion within this group (LEHNERT in press) is strongly supported by other characters like indusium type and laminar dissection.

The second group includes TRYON's *Cyathea fulva* group and the rest of the varieties of *C. caracasana*. These species are characterized by concolorous or bicolorous petiole scales with brown to yellow margins without marginal teeth. If the peripheral cells of the margins are truly white, then this portion is very narrow and does not account to the general color of the scale. Strongly contrasted scales can intergrade into weakly contrasted ones within one population or even on one plant. For example, the trunk scales of *C. carolihenrici* are concolorous orange-brown while the lower petiole scales are dark castaneous to atropurpureous with sharply delineated orange margins; more distally on the petiole, the scales assume a lighter hue with the marginal color changing gradually into the central color, i. e., from orange to brown. The petiole scurf is uniformly colored, tan, brown or castaneous and consists of smaller squamules than in the previous group.

Most of the species covered here are large plants with trunks mostly more than 8 cm diameter and to 15 m or more in height. A cover of old petiole bases on the trunk is only present in small plants; after reaching a trunk height that surpasses the length of the leaves, these are shed completely due to their own weight. A clean shedding of fronds when the trunk is still shorter than the frond length is rare and specific, as in *C. carolihenrici* and *C. plicata*. With the exception of *C. dissoluta*, adventitious buds and lateral shoots are not produced by the species treated here. Only after injuries of the apex, buds may be produced to create substitute apices. In *Cyathea squamipes* H. Karst., this can result in multiple crowned plants (pers. obs.). Similar conditions are known from Paleotropical Cyatheaeceae (HOLTTUM 1963).

### 3.2 *Cyathea caracasana* (Fig. 16)

*Cyathea caracasana* (Klotzsch) Domin: DOMIN 1929a: 262. – *Alsophila caracasana* Klotzsch: KLOTZSCH 1844: 541. – *Trichipteris caracasana* (Klotzsch) R. M. Tryon: TRYON

**Figs. 1–7.** *Cyathea* spp. in the field. – **1–2**. *C. meridensis* var. *nana*. **3**. *C. meridensis* var. *obtecta*. **4–5**. *C. carolihenrici*. **6**. *C. squamipes*. **7**. *C. catacampta*.

**Figs. 8–15.** *Cyathea* spp. in the field. – **8**. *C. squamipes*. **9–10**. *C. catacampta*. **11–12**. *C. lindeniana*. **13–14**. *C. frondosa*. **15**. *C. parvifolia*.

1970: 45. – Type: Venezuela. Caracas, »Moritz 117« (lectotype, B-fragm. US [designated herein]; isolectotypes, GH, P).

*Hemitelia sherringii* Jenm.: Jenman 1886: 266. – *Cyathea sherringii* (Jenm.) Domin.: Domin 1929a: 264. – Type: Jamaica. Rose Hill, XI.1886, »Sherring s. n.« (holotype, K-photo B; isotype, US).

*Cyathea ocanensis* Baker: Baker 1891: 184. – Type: Colombia. [Norte de Santander], Ocaña, »Kalbreyer 608« (holotype, K; isotypes, B [label "Dept. Santander, Nuga"], COL, US).

*Alsophila caracasana* var. *petiolularis* Domin: Domin 1929b: 95, ex descr. – Syntypes: Venezuela. Caracas, »Buschel s. n.« (n. l.); [Aragua], Colonia Tovar, »Pittier 10011« (n. l.).

*Cyathea subindusiata* Domin: Domin 1929b: 67. – Type: Venezuela. "Habitat in Columbia ad Caracas", »Buschel s. n.« (holotype, n. l.; isotypes, B [label "Venezuela"], BM-photo GH [label "Venezuela, 1855"], K).

*Cyathea producta* Maxon: Maxon 1922: 438. – Type: Cuba. Palma Mocha Peak, Sierra Maestra, Oriente, »Léon 11181« (holotype, US; isotype, NY).

Selected specimens examined

Colombia. **Antioquia**. Alto de Cueras, 10 km E of La Blanquita, 12 km W of Nutibara, 6°40'N, 76°30'W, 1670 m, 3.III.1996, »Gentry et al. 75986« (MO, UC). **Cundinamarca**. Bojaca, Vereda de San Antonio, "La Merced" en faja de robledales proximo a la carretera que conduce de Mosquera a La Mesa, 2600–2700 m, VII.1964, »Torres & Lozano 95« (COL). **Guajira**. Cerro Pintado, región del Espejo, 2300 m, 12.XI.1989, »Cuadros-V. 2336« (COL). **Nariño**. Ricaurte, Reserva Natural La Planada, Cerro León, 1°09'37"N, 77°59'13"W, 2145 m, 29.II.1997, »Guzmán 12« (UC). **Norte de Santander**. Cordillera Oriental, región del Sarare, Quebrada del Sararito, 1930–1950 m, 23.X.1945, »Cuatrecasas et al. 12584, 12584A« (COL).

Venezuela. **Trujillo**. Boconó, P. N. Guaramacal, vertiente sur, parcela de estudio fitosociológico nº 7, 9°12'28"N, 70°09'41"W, 1950 m, 19.–22.XII.1995, »Cuello et al. 1276« (UC).

## Description

Trunks to 4.5–5.0(10.0) m tall, to 7–10 cm diameter. Petioles to 30–35 cm long or more, muricate to sparsely aculeate with spines to 3 mm long, stramineous to yellowish, basally darker, often plumbeous but never blackish; scurf dark brown to castaneous, consisting of scattered branched hairs and erect dissected squamellae (similar to Fig. 17B). Petiole scales to 15.0–25.0 × 3.0–4.5 mm, broadly lanceolate to ovate-lanceolate (similar to Fig. 17A), variable, dark brown to blackish with narrow golden brown to yellowish margins, or nearly concolorous brown, with straight to falcate tips.

Laminae to 150 × 100–150 cm, firmly chartaceous; bipinnate-pinnatifid, apices gradually reduced. Leaf axes smooth or rhachises with scattered small corticinate spines, stramineous to yellowish brown on both sides, scurf absent or rarely with some small pale brown to whitish squamules to 0.5 mm long, usually clumped and appearing amorphous; costules, costae, and distal parts of rhachises adaxially with hairs 1.0–1.5 mm long, tan to white; junctions of costae and rhachises abaxially swollen, each with a flat, elliptic pneumathode to 3.0–4.5 × 1.5–2.0 mm, inconspicuous, of color of the leaf axes or darker brown. Pinnae to 50–75 cm long, alternate, 8–10 pairs per frond, stalked to 2.0–3.0 cm. Pinnules to 100–130 × 20–26 mm (Fig. 16); largest ones linear-oblong to lanceolate, tapering from the middle to long-acute to attenuate tips, basally cuneate to weakly cordate, stalked 1–3(5) mm, 1.5–2.5 cm between the stalks; segments patent to weakly ascending, their tips obtuse to rounded, margins flat, weakly crenulate to subentire (Fig. 16); basal segments opposite to subopposite, rarely remote and free; pinnules weakly dimorphic, sterile ones with sinuses closed or to 3 mm wide, obtuse, fertile ones with sinuses 2–3 mm wide, acute to obtuse; segments glabrous adaxially, abaxially glabrous or with few appressed white trichomidia on the veins, rarely with small (ca. 0.4 mm long), white, multicellular hairs on veins and below the sinuses, also between them, or with single white, subbullate squamules distally on the midveins. Veins yellowish and weakly to strongly protruding adaxially, planar to weakly protruding abaxially, in the color of the laminar tissue, yellowish, or rarely brown; sterile veins forked or simple, fertile veins forked.

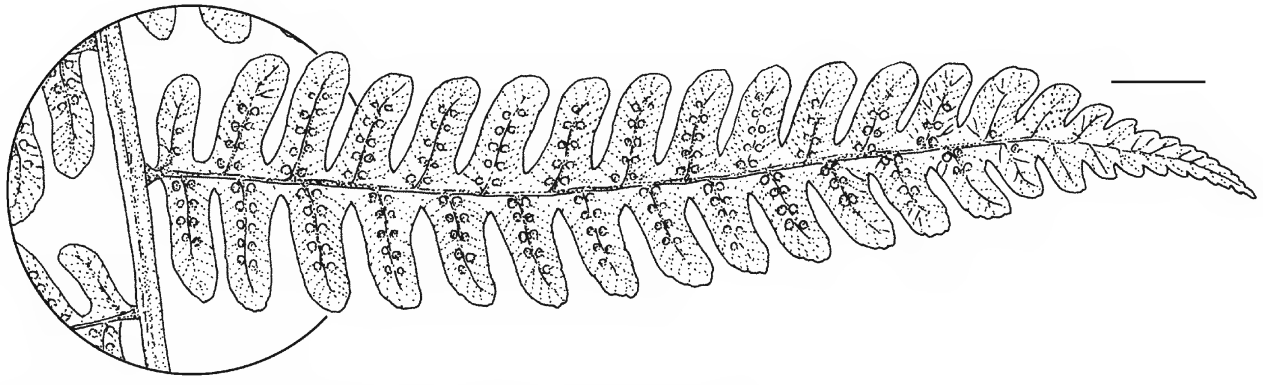

**Fig. 16**. *Cyathea caracasana*, fertile pinnule (»Moritz 394« B). – Scale: 1 cm.

Sori 1.0 mm diameter, costal, at vein forks; indusia ephemeral, very thin, colorless to whitish, opaque, potentially sphaeropteroid, with a brown umbo, but often fragmented and shed before the sporangia open, completely gone at maturity or remaining as clear, colorless fragments at the receptacles; receptacles globose, 0.5 mm diameter; paraphyses numerous, hyaline, 0.2–0.3 mm long, shorter than the sporangia. Spores pale yellow, perispore not examined.

#### Distribution and habitat

In moist montane forests at 1200–2700 m in Cuba, Jamaica, Colombia, and Venezuela.

#### Remarks

The original material of *Cyathea caracasana* at B is quite ample. There are six sheets containing two frond apices, several fertile pinnae, two petioles, one crosier, and even fragments of trunk cross sections that belong all to one species. Three sheets bear the number »117« of the type collection, the other ones are numbered with »117/394« or »117 et 394«. The latter do not appear to be a mixed collection of different plants so I suspect that the double numbers reflect a peculiarity in the record keeping of the collector. The double-numbered specimens are good complementary reference material to the lectotype »Moritz 117« and may be regarded as paratypes.

The main character of *Cyathea caracasana* is the fragile and fugacious indusia. In fact, it is hardly notable in one of the sheets of »Moritz 117/394« (B). Another sheet bearing the number 394 (B, GH n. v.), a collection cited to be nearly identical by Tryon (1976), shows indusia that are pulverized to a white granular layer on intact sori. Only the brown umbos on top make them recognizable as indusia. The laminar indument is limited to some small (ca. 0.4 mm long), white, multicellular hairs distributed abaxially on the veins (below the sinuses also between the veins) and small white, lanceolate to subbullate squamules. At first sight, the firmly herbaceous to chartaceous laminae appear glabrous. The pinnules are broadly linear or weakly oblong as pictured by Vareschi (1969), with their apices attenuate to long-acuminate. The petioles are muricate to shortly aculeate, yellowish to stramineous, with scattered, castaneous scurf that appears amorphous but consists of oblong to lanceolate squamules with weakly erose margins. This separates *C. caracasana* from the similar *C. meridensis*, where the scurf is usually dense and persistent on dark brown to castaneous, mostly inermous petioles.

Cuban plants of *Cyathea caracasana* are aberrant from the Andean and Jamaican populations in having many long multicellular hairs abaxially on the veins (Caluff 2003). This may be a distinct variety, represented by the synonym *C. producta* Maxon.

### 3.3 *Cyathea crenata*
(Fig. 17)

*Cyathea crenata* (Sodiro) H. Christ: Christ 1897: 323. – *Hemitelia crenata* Sodiro: Sodiro 1893: 522. – Type: Ecuador. Pichincha, "Crece en los declives del Volcán Atacatzo (Canzacoto, Boloña, 1500–2000 m)", »Sodiro s. n.« (n. l.). – Lectotype (designated by Tryon 1976): Ecuador. Pichincha, "Hacienda Boloña, 1550 m, 1882", »Sodiro s. n.« (P).

#### Selected specimens examined

E c u a d o r . **Morona-Santiago**. Area of Huamboya, región oriental, [ca. 1°48'S, ca. 78°15'W], 1500 m, 15.II.1944, »Acosta-Solis 7496« (MO, UC); Pachicutza, at "Escuela Fiscomisional Cardinal Döpfner", km 140 on road Loja–Gualaquiza, 3°37'S, 78°34'W, 900–1000 m, 26.–27.IV.1973, »Holm-Nielsen et al. 4548« (AAU). **Napo**. Cantón Quijos, road between Cuyuja and Baeza, 0°27'S, 77°56'W, 2100 m, 8.V.1990, »Palacios & Freire 4971« (MO). **Pichincha**. Ca. 2 km NW of Mindo, Hacienda San Vicente, ca. 2 km from finca buildings, 1450–1600 m, 10.–14. II.1985, »Foster 85-34« (UC); Quito, Parroquia Nanegal, Reserva Maquipucuna, trail El Pacchal to Cerro Campana, 0°08'N, 78°38'W, 1270 m, 6.VI.2000, »Wilson 2758« (UC).

P e r u . **Cajamarca**. San Ignacio, Dist. San José de Lourdes, Buenos Aires (Cerro El Parco), 5°42'04"S, 77°53'06"W, 1900 m, II.2006, »Bonino 307, 309« (MO, UC).

#### Description

Trunks erect, straight, to 7–12 m tall, to 12–15 cm diameter, without old petiole bases, cortex dark brown, apices hidden in fascicles of petioles; adventitious buds lacking. Fronds to 150–280(300) cm long, patent, weakly arching. Petioles to 35–50 cm long, muricate to sparsely aculeate with spines to 3–5 mm long, dull brown, basally darker, often plumbeous but never blackish, distally stramineous to yellowish; scurf pulverulent, not matted, mostly dark brown, sometimes partially paler brown to tan, consisting of erect dissected squamellae, 0.2–0.6(1.0) mm long (Fig. 17C). Petiole scales to 20.0–37.0 × (2.5)3.0–4.5(5.0) mm, broadly lanceolate to ovate-lanceolate, always dark, matte to rarely shiny, black to dark atropurpureous, with narrow atropurpureous to yellowish white margins, these often abraded (Fig. 17A), centers in back light with darker streaks; tips straight to falcate, weakly undulate to twisted.

Laminae to 150–250 × 110–155 cm, ovate-elliptic, firmly chartaceous to subcoriaceous, brittle, bipinnate-pinnatifid, apices gradually reduced. Pinnae to 67–88 cm long, alternate, ca. 15 pairs per frond, sessile to subsessile, stalked to 0.5 cm. Leaf axes stramineous to yellowish brown abaxially, brown to yellowish brown adaxially, inermous (or rhachises with scattered small spines), costules densely hairy adaxially, distal parts of the costae and rhachises with tan to brown, antrorsely curved hairs to 0.6 mm long, otherwise leaf axes sparsely hairy with white, curved hairs 0.2–0.5 mm long; brown petiole scurf sometimes reaching up to the lower half of rhachises and adjacent bases of costae, in plants with short petioles here also with

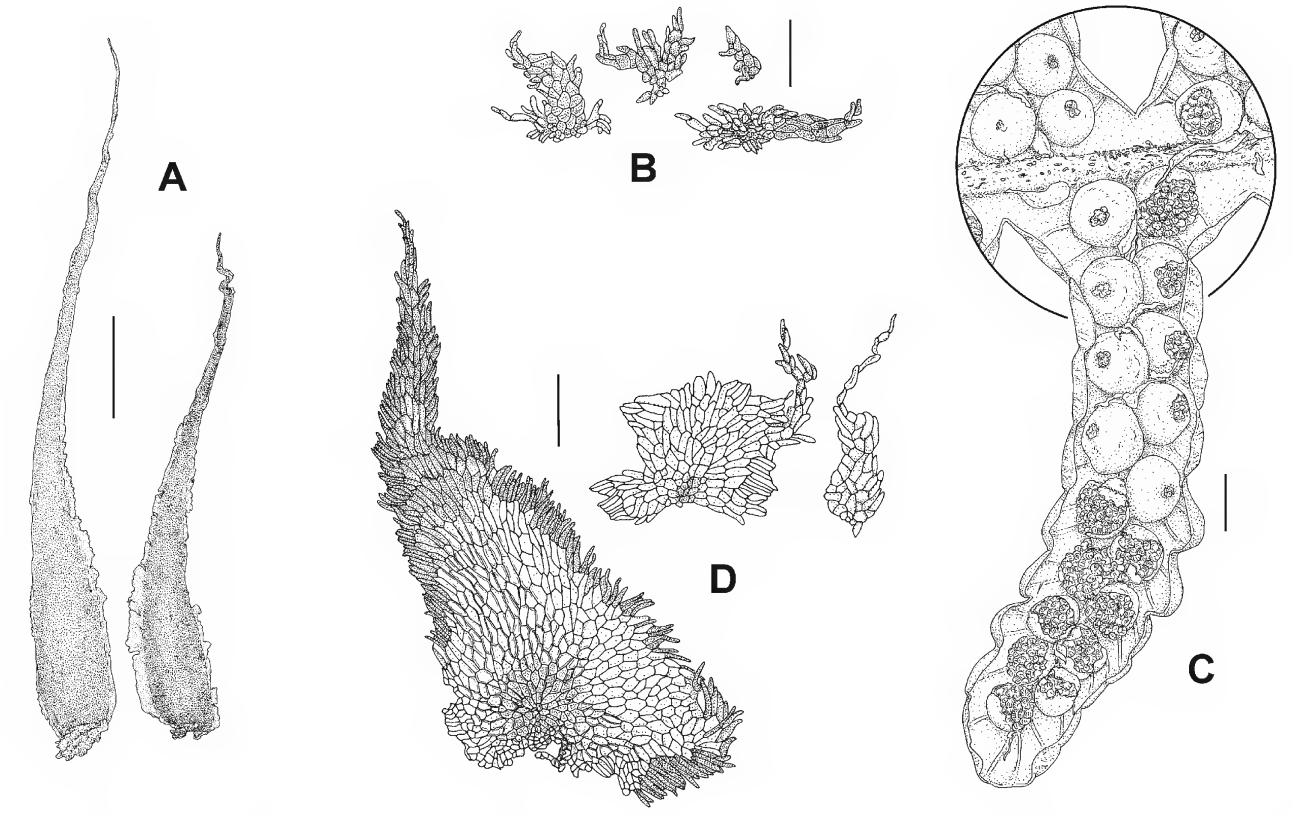


**Fig. 17.** *Cyathea crenata* (all from »Lehnert 1212« UC). – **A**. Petiole scales. **B**. Squamules of petiole scurf. **C**. Fertile segment abaxially. **D**. Laminar scales/squamules. – Scales: 5 mm (A), 1 mm (C), 0.2 mm (B, D).

persistent crosier/petiole scales; some small, pale brown to whitish squamules to 0.5 mm long on costae and costules (Fig. 17D), especially in the axils, usually clumped and appearing amorphous; costules sometimes with white, lanceolate scales to 5 mm long with dark marginal teeth (Fig. 17D); junctions of costae and rhachises abaxially swollen, each with a grayish brown, flat, elliptic pneumathode to 3.0–4.5 × 1.5–2.0 mm. Pinnules to 9.5–13.0 × 2.4–2.6 cm, sessile to subsessile (stalked to 0.5 mm), (15)20–29 mm apart; largest pinnules linear-oblong, tapering from well beyond the middle to long-acute to short-attenuate tips, rarely long-triangular, basally truncate or weakly cordate, with the basal segments slightly covering the costae; pinnules weakly dimorphic, sterile ones with obtuse to acute sinuses 1–2 mm wide, fertile ones with obtuse to polygonal sinuses 3–4 mm wide; segments patent to weakly ascending, distally falcate, their tips obtuse to round, margins weakly revolute, crenulate to crenate (Fig. 17C), rarely subentire, basal segments alternate to subopposite, not remote; segments adaxially glabrous, abaxially glabrous or with few appressed white trichomidia on the veins and with white multicellular hairs to 0.6 mm long on and between veins in proximity to costules and midveins, with white, flat to subbullate squamules on midveins. Veins yellowish and weakly to strongly protruding adaxially, planar to weakly protruding abaxially, in the color of the laminar tissue, or yellowish to rarely brown; sterile veins forked or simple, fertile veins forked once or twice (= bifurcate, three tips).

Sori 1.0 mm diameter, costal (Fig. 17C), at vein forks or on the back of bifurcate veins; indusia fragile, very thin, papery, matte white, opaque, deeply urceolate to subsphaeropteroid, rarely sphaeropteroid with weak umbo, developed as a mucose film in fresh material, ephemeral to persisting as a shallow cup or as fragments on the receptacle, the indusial tissue often crinkly and flattened to the lamina; receptacles globose, 0.5 mm diameter; paraphyses numerous, hyaline, 0.4–0.5 mm long, of the same length as the sporangia. Spores pale yellow, perispore not examined.

Distribution and habitat

In moist montane forests at 900–2100 m, scattered from Ecuador to northern Peru.

### Remarks

The sheet labelled "Corazon", »Sodiro s. n.« at SI [nº 22862] represents this species. The sheet filed under *Hemitelia crenata* at Q ("Crescit in silv. subtr. prop. San Florencio", V.1883, »Sodiro s. n.«) is *Cyathea corallifera* Sodiro.

*Hemitelia crenata* Sodiro was included in *Cyathea caracasana* (Klotzsch) Domin var. *caracasana* by Tryon (1976). Sodiro (1893) reported that the indusia of this species appear like a mucose film in fresh material. In dried material, such indusia are easily fragmented and may disintegrate without leaving a trace. This is observed in the type material of both *C. caracasana* and *C. crenata*. Additional collections showed that the indusia of *C. crenata* are more often persistent as a flattened cup of papery texture while those of *C. caracasana* are typically gone in mature sori. These differences in the indusia correlate with distinct features of the laminae: in *C. caracasana*, there are 8–10 pairs of definitely stalked pinnae per frond; in *C. crenata*, 12–15 pairs of sessile to subsessile pinnae are present. *Cyathea crenata* differs from *Cyathea caracasana* in being short-pubescent on the costules abaxially. If hairs are present on the laminae abaxially in *C. caracasana*, they are mainly on and between the lateral veins and rarely on the costules. *Cyathea crenata* has also white, fimbriate to lacerate squamules and small flattish scales with dark marginal teeth and sometimes dark, central stripes. The latter features resemble more *Cyathea corallifera* Sodiro, but that species has dense, white petiole scurf consisting of relatively large squamules and dark brown petiole scales with broad white margins.

*Cyathea crenata* may be confused with *C. squamipes* H. Karst. and *C. catacampta* Alston. Plants of these species may have pubescent costules like *C. crenata*, but have also flat to bullate, orange-brown squamules associated with this pubescence; laminar squamules of *C. crenata* are always whitish. Furthermore, the indusia are tan to brown, lustrous, translucent, and usually persisting in *C. squamipes* and *C. catacampta*, while they are whitish, matte, opaque, and ephemeral in *C. crenata*.

*Cyathea carolihenrici* Lehnert and *C. meridensis* H. Karst. have similar fine, dark brown to dark castaneous scurf similar to that of *C. crenata* and *C. caracasana*, but differ in the dark brown to atropurpureous color of their axes and the broader margins of their more bicolorous petiole scales.

## 3.4 *Cyathea carolihenrici*
(Figs. 4–5, 18)

*Cyathea carolihenrici* Lehnert: Lehnert 2003: 180. – Type: Bolivia. La Paz, Prov. Nor Yungas, Cotapata-Santa Barbara, 16°18'S, 67°52'W, 3150 m, 6.VIII.2000, »Lehnert 11« (holotype, GOET; isotypes, LPB, UC).

### Selected specimens examined

P e r u . **Cuzco**. Urubamba, 2050 m, »Bonino 1127« (CUZ).

B o l i v i a . **La Paz**. Muñecas, Camata, Alturas de Quiñuaña, 3.7 km SW of the village, 15°15'24"S, 68°46'35"W, 2820 m, 15.V.2006, »Fuentes et al. 10595« (UC, MO); 5–6 km de Chuspipata a Yolosa, 16°18'S, 67°48'W, 2750 m, 2.VIII.2000, »Lehnert 2« (GOET, LPB, UC).

### Description

Trunks to 7 m tall, to (10)15–20 cm diameter, without old petiole bases, apices hidden in fascicles of petioles (Fig. 4). Fronds to 300 cm long, arching to drooping from the middle. Petioles to 100 cm long, inermous to verrucate, rarely near the base short-aculeate, dark castaneous to blackish; scurf dark brown to castaneous, a dense tomentum of trichomidia and lanceolate squamelae with lacerate margins to 0.5 mm long, beneath the petiole scales also some larger squamellae, squamellar insertion characteristically asymmetrical (Fig. 18B), squamellar margins in backlight not lighter than the centers. Petiole scales to 15–20 × 3.5–4.0(8.0) mm, lanceolate to ovate-lanceolate (Fig. 18A), discordantly bicolorous, centers dark brown to blackish, margins orange to golden brown, tips long-attenuate, often twisted.

Laminae to 150 × 130–140 cm, coriaceous, bipinnate-pinnatifid to tripinnate (Fig. 5), apices gradually reduced. Leaf axes dark brown adaxially, in strong contrast to the lamina, brown to stramineous abaxially, smooth or rhachises with scattered small corticinate spines, with persisting scurf of minute fringed brown squamellae; costules, costae, and distal parts of rhachises with hairs 1.0–1.5 mm long adaxially; junctions of costae and rhachises swollen. Pinnae to 55–65 cm long, alternate, 12–15 pairs per frond, stalked to 1.5–3.0 cm (Fig. 5). Pinnules to 130 × 40 mm, largest ones triangular to lanceolate, tips long-acute to attenuate, bases truncate to cuneate or weakly cordate, short to long-stalked, the stalks to 3–5 mm; segments weakly ascending, their tips obtuse to rounded, margins flat to revolute, slightly crenulate to entire; basal segments sometimes remote; segments glabrous adaxially, abaxially glabrous or with few short erect white multicellular hairs 0.5–1.0 mm long on the veins, near the costules also between them, with some scurf like that of the petioles.

Sori subcostal, at vein forks; indusia subsphaeropteroid, without umbo, sometimes with scale on top. Spores pale yellow, with verrucate exospore, perispore baculate.

### Distribution and habitat

In moist tropical montane forests at 2050–3150 m in southern Peru and western Bolivia.

### Remarks

*Cyathea carolihenrici* replaces *C. meridensis* in the Central Andes. Given the strong resemblence and the vi-

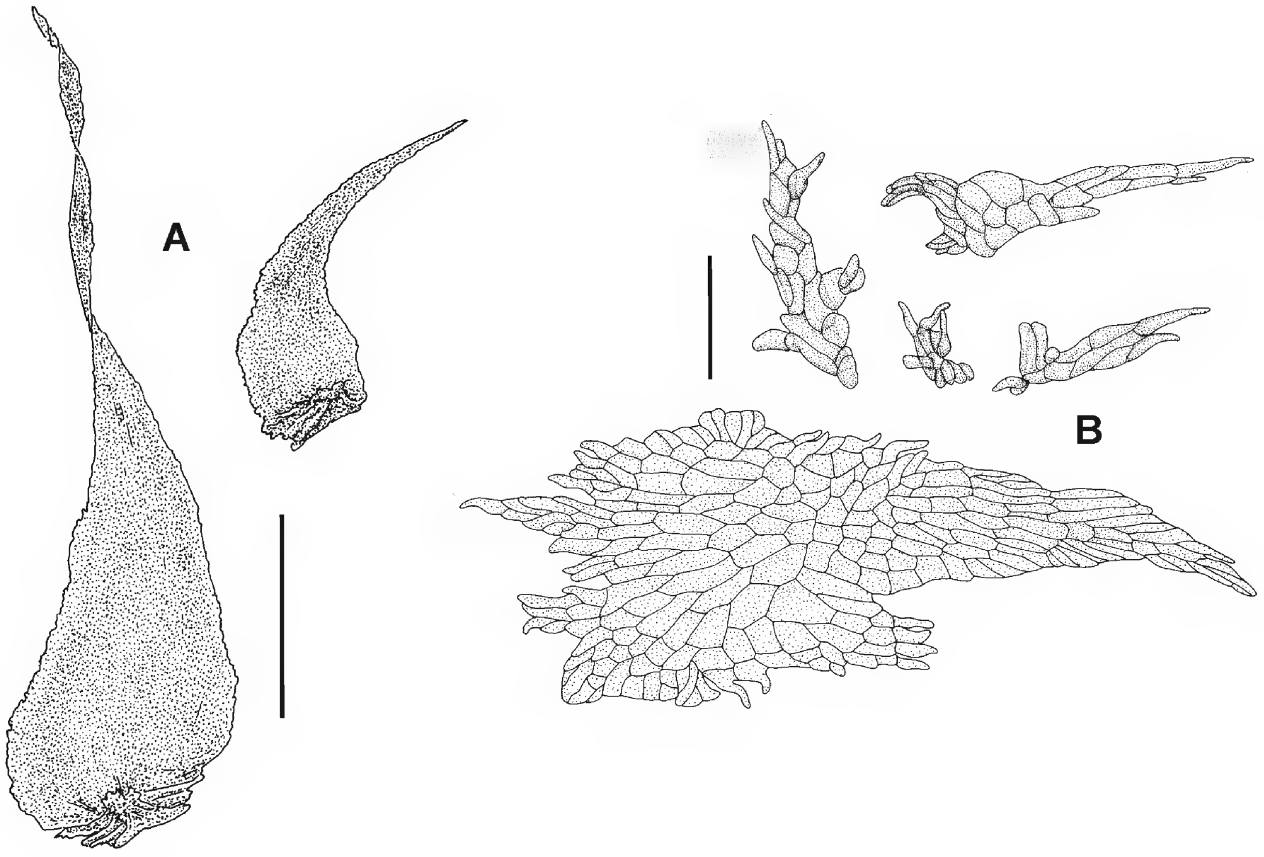


**Fig. 18.** *Cyathea carolihenrici* (all from »Lehnert 619« GOET). – **A**. Petiole scales. **B**. Squamules of petiole scurf. – Scales: 5 mm (A), 0.2 mm (B).

cariant distribution of both species, a close relationship between them is undoubted. They can be distinguished by the different trunk diameter [to (10)15–20 cm in *C. carolihenrici* vs. to 5–12 cm in *C. meridensis*] and the details of the petiole scurf (squamellae lanceolate, asymmetrically inserted, and not lighter margined in backlight vs. squamellae oblanceolate, symmetrically inserted, and lighter margined in backlight).

### 3.5 *Cyathea meridensis*
(Figs. 1–3, 19)

#### 3.5.1 General

*Cyathea meridensis* H. Karst.: Karsten 1869: 141, ex descr. – Type: Venezuela. Mérida, "Habitat in silvis montanis Meridensibus altitudine 2000 m", »Karsten s. n.« (n. l.).

#### Description

Trunks to 0.3–10 m tall, to 5–12 cm diameter, with (Figs. 1–3) or without old petiole bases, cortex dark brown to black, apical parts with lanceolate scales, concolorous dark orange-brown to bicolorous with a dark to black central stripe, colors transitional to sharply contrasting; apices hidden in fascicles of petioles. Fronds to 50–360 cm long, arching to drooping from the middle (Fig. 1), sometimes scrambling. Petioles to 17–200 cm long, inermous to verrucate or shortly aculeate, brown to castaneous; scurf dark brown to castaneous, a dense matted tomentum of trichomidia and oblanceolate squamellae with fimbriate to dissected margins, the latter appressed, rarely some larger ones erect, squamellar insertion characteristically symmetrical (Fig. 19B, C), squamellar margins in backlight lighter than the centers. Petiole scales 15–25 × 2.5–5.0 mm, lanceolate to ovate-lanceolate (Fig. 19A), concordantly to discordantly bicolorous, variable, with dark brown to blackish centers and narrow orange to golden brown margins.

Laminae to 55–240 × 27–150 cm, bipinnate-pinnatifid to tripinnate, coriaceous, apices gradually reduced. Leaf axes smooth, dark brown adaxially, in strong contrast to the lamina, brown to stramineous abaxially, with persisting scurf of minute fringed brown squamellae, sometimes

with flat, lanceolate, concolorous brown scales in the axils, hairs lacking abaxially, costules, costae, and distal parts of rhachises adaxially with hairs 1.0–1.5 mm long, tan to brown on rhachises, white to tan on costules and costae; junctions of costae and rhachises swollen, abaxially with a flat to sunken, elliptic pneumathode to 3.0–4.5 × 1.0–1.5 mm. Pinnae to 16–75 cm long, alternate, 8–15 pairs per frond, stalked to (0.3)0.5–3.4 cm. Pinnules to 65–120(130) × (6)11–45 mm, triangular to oblong, tapering from the base or beyond the middle to acute or attenuate tips, subsessile to long-stalked; segments weakly ascending, their tips obtuse to round, margins flat to revolute, crenate to entire. Veins yellowish and weakly protruding adaxially, planar to weakly protruding abaxially; sterile veins forked or simple, fertile veins forked.

Sori to 1.0–1.4 mm diameter, subcostal, in forks of veins; indusia subsphaeropteroid to sphaeropteroid, dark brown, persistent, with or without umbo, sometimes with scale on top; receptacles globose, 0.4–0.3 mm diameter; paraphyses few, thin, hyaline, of the same length as the sporangia (0.5 mm). Spores pale yellow, perispore not examined.

### Distribution and habitat

In moist montane forests at 1200–2500(2870) m in Venezuela, Colombia, Ecuador, and northern Peru.

### Remarks

The typification of *Cyathea meridensis* remains unclear (Tryon 1976). One sheet annotated as *C. meridensis* is at B, with an old label probably handwritten by Karsten, but the specimen does not match the original description (Karsten 1869). The species is maintained here because there are many collections from Colombia that sufficiently match the diagnosis and form the basis for the present description. These plants have trunks to 6 m tall but only 5–6 cm diameter and in this regard match the original description well (Karsten 1869). They are also characterized by long-triangular pinnules and by fine, dark brown scurf on the leaf axes and veins, which is not mentioned in the description but it is likely to have been overlooked. I postpone the choice of a neotype until I have seen material from the type locality, which should be preferred for this purpose.

The petiole scurf of *C. meridensis* is identical to that of *C. plicata* and superficially similar to that of *C. carolihenrici*. The three species are also similar in the coriaceous laminar texture and the general color pattern of the larger scales (i. e., strongly contrasted on the outer parts of the petioles, transitional to concolorous orange-brown nearest the trunk). The differences between *C. plicata* and *C. meridensis* are in the size and orientation of the largest pinnules, which are usually less than 2 cm broad, sessile, and pointed upwards in the former species, and more than

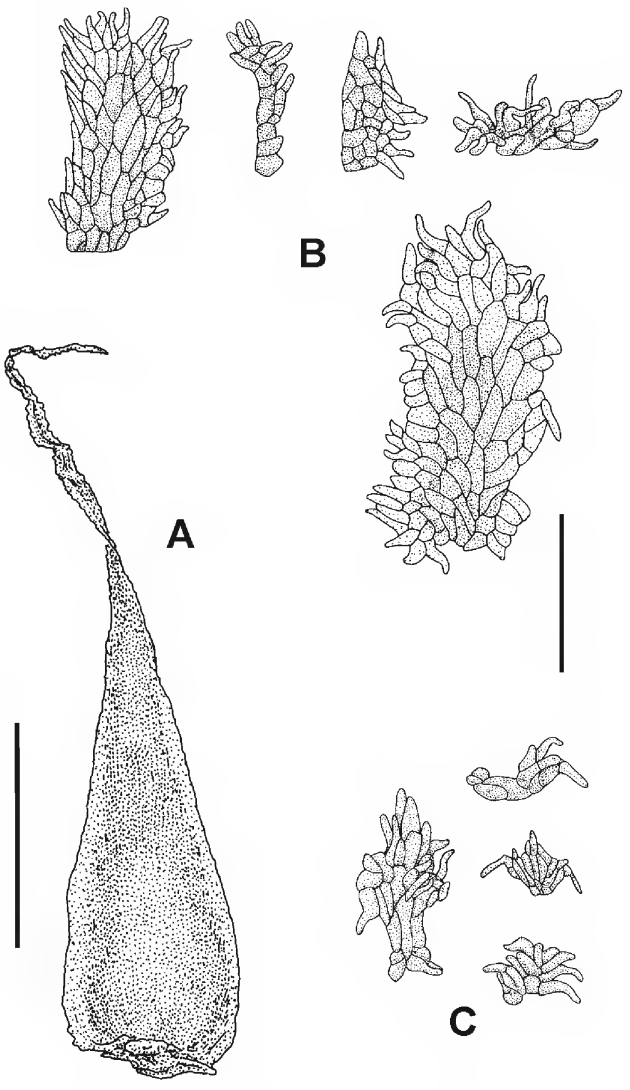


**Fig. 19.** *Cyathea meridensis* (A, B from »Lehnert 991« GOET; C from »Lehnert 1079« GOET). – **A**. var. *nana*, petiole scale. **B**. var. *nana*, squamules of petiole scurf. **C**. var. *obtecta*, squamules of petiole scurf. – Scales: 5 mm (A), 0.2 mm (B, C).

2 cm broad, short-stalked, and in plane with the leaf axes in the latter. *Cyathea carolihenrici*, which strongly resembles *C. meridensis* in the frond architecture, usually has thicker trunks [to (10)15–20 cm in diameter vs. 5–12 cm in *C. meridensis*], asymmetrical petiole scurf squamules (vs. ± symmetrical), and dark brown to castaneous laminar squamules (vs. brown to yellowish).

Petiole scales in Colombian *C. meridensis* are more strongly contrasted than in the plants from farther south, which have nearly black centers and narrow, orange-brown margins, sometimes appearing concolorous black. Ecuadorian and northern Peruvian populations also retain a sheath of old petiole bases on their trunks, reaching

8–10 cm in diameter. They grow either on open ridges as diminutive tree ferns to 1.5 m tall, with small fronds and often sessile pinnules, or they grow in the dense understory with large fronds to 3 m long draped over adjacent vegetation or being supported by nearby branches. These divergent phenotypes are most likely adaptations to unfavorable environmental conditions. Their ranges coincide with the Huancabamba-Amotape-region, a climatical and geological enclave in the Andes that forms both frontiers and sole home for a plethora of plant and animal species. I chose to present separate descriptions for the two divergent forms and to name them at varietal rank in order to facilitate the delimitation from similar, unrelated species.

### 3.5.2 *Cyathea meridensis* var. *meridensis*

Selected specimens examined

C o l o m b i a . **Antioquia**. Betania, Vereda Aguas Lindas, finca Agua Linda, río El Pedral, 1700 m, 19.VIII.2004, »Giraldo & Mejia 2077« (COL). **Cauca**. Parque Nacional Munchique, El Tambo, vereda La Romelia, La Gallera, 2000 m, 27.VII.1997, »Acevedo et al. 308« (COL). **Chocó**. La Mansa, Carretera Medellin–Quibdó km 105+500, en bosque circunadando antena Telecom, 2300 m, 3.VI.1987, »Mejia 106« (COL). **Cundinamarca**. Road from Bogotá to Fusagasugá, just S of the crest of the Cordillera, 25 km from Bogota, 19.VII.1976, »Barrington 455« (COL); Cabrera, Vereda Nuñez, en alrededores de la Quebrada Negra, 2300–2400 m, 14.VII.1992, »Linares & Morales 2346« (NY). **Huila**. La Plata, vereda Agua Bonita, Finca Merenberg, 1200–1300 m, 13.VII.1979, »Díaz-Piedrahita 450« (COL). **Risaralda**. Santuario, Vereda Las Colonias, margen derecha del Río San Rafael, 2500 m, 26.II.1987, »Torres et al. 2314« (COL). **Santander**. Piedecuesta, Vereda Cristales, trocha que conduce al NE de la Estación, 2200 m, 11.II.2001, »Bustos-P. et al. 40« (COL).

Description

Trunks to 10 m tall, to 5–12 cm diameter, erect, old petiole bases soon caducous, petiole scars conspicuous; apices hidden in fascicles of petiole bases. Fronds to 120–360 cm long, patent to arching, distally drooping. Petioles to 120 cm long, inermous, or rarely with few spines at the base in large plants, dark brown to castaneous, basally darker, distally often paler, stramineous to yellowish, on each side with a line of narrow, brown to rusty brown, inconspicuous pneumathodes; scurf dark brown to castaneous, a dense matted tomentum of trichomidia, dissected squamellae, and oblanceolate squamules with fimbriate margins. Petiole scales lanceolate to ovate-lanceolate, concordantly to discordantly bicolorous, variable, with dark brown to blackish centers and narrow orange to golden brown margins.

Laminae to 240 × 110–150 cm, bipinnate-pinnatifid to tripinnate. Pinnae to 55–75 cm long, 15–18 pairs per frond, alternate, stalked to (1.8)2.0–3.4 cm, distally narrowly green-alate, distal segments simply adnate to weakly decurrent. Costae to 3 mm broad. Pinnules long-triangular, to 120 × 22–45 mm, short to long-stalked 2–5 mm, basally truncate to weakly cordate; basal segments sometimes remote, connected by laminar tissue or free, then sometimes segments weakly auriculate; segments ascending, distally weakly falcate, with obtuse to round tips, with obtuse to rectangular sinuses 1–3 mm wide, margins crenulate to strongly crenate, sometimes revolute and appearing entire, segments weakly hairy adaxially near the margins, the hairs multicellular, white, to 1 mm long, abaxially without hairs but veins with small appressed trichomidia, scurf remnants, and some flat, lanceolate to ovate, yellowish to brown scales with fimbriate margins, to 2 mm long.

Sori to 1.0–1.4 mm diameter, costal to subcostal, in vein forks; indusia subsphaeropteroid to sphaeropteroid, dark brown, persistent, with or without umbo, sometimes with scale on top.

Distribution and habitat

Found sporadically in montane forests at 1200–2500(2870) m in Venezuela and Colombia, to be expected in adjacent Ecuador.

Remarks

*Cyathea meridensis* var. *meridensis* is characterized by the tall, thin stems and the dark appearance of its dried fronds. It may be mistaken for *C. lindeniana*, but the latter species has larger, erect scurf squamules and dark, but not blackish petiole scales, whose margins are often not contrasting with the centers.

### 3.5.3 *Cyathea meridensis* var. *nana* **n. var.**
(Figs. 1–2, 19A, B)

T y p e : E c u a d o r . **Zamora-Chinchipe**. Estación Cientifica San Francisco, T1, entre refugio y camino a las antenas, 3°59'33.6"S, 79°04'14.5"W, 2550 m, 24.X.2003, »Lehnert 970« (holotype, GOET; isotype, QCA).

P a r a t y p e s : E c u a d o r . **Zamora-Chinchipe**. Reserva Tapichalaca, study plot B1, nearby Ventanillas, 4°29'S, 79°07'W, 2600 m, 27.X.2003, »Lehnert 991« (GOET, QCA); Reserva Tapichalaca; Ventanillas, trail to study plots B2 and B3, 4°29'S, 79°07'W, 2550–2600 m, 3.XI.2003, »Lehnert 1077« (GOET, QCA); Reserva Tapichalaca, 2600–2650 m, 18.–19.IX.2004, »Lehnert & Kessler 1301« (GOET, QCA, UC); Podocarpus National Park, near the Yangana–Valladolid road, 4°28'S, 79°09'W, 2700 m, 8.VII.2000, »Pedersen et al. 104397« (AAU, LOJA); along road Yangana–Valladolid, just past the Nudo de Sabanilla towards Valladolid, 2500 m, 7.V.1991, »van der Werff & Palacios 9354« (MO, UC). – P e r u . **Cajamarca**. San Ignacio, San José de Lourdes, Cerro Picorana, 4°58'S, 78°53'W, 2830 m, 17.VIII.1998, »Campos et al. 5550« (MO, UC); ibid., Cordillera between Bajo Picorana and El Picorana, 4°58'S, 78°53'W, 2420–2470 m, 19.VIII.1998, »Campos et al. 5616« (MO).

Description

A var. *meridensi* truncis humilioribus petiolis obtectis frondibusque cum pinnis paucioribus (8–10 pares vs. 12–15 pares) pinnulisque minoribus (usque 65(80) mm vs. 65–120 mm longis) differt.

Trunks to 1.0–1.5 m tall, erect, to 12 cm diameter including persistent old petiole bases; apices hidden in fascicles of petioles (Figs. 1, 2), unfolding one to three fronds at a time. Fronds to 50–150 cm long, arching-patent. Petioles to 17–28 cm long, inermous, dark brown to castaneous (Fig. 2), on each side with a line of well spaced, rusty brown, inconspicuous, narrow elliptic pneumathodes; scurf consisting of small trichomidia and oblanceolate, strongly dissected squamules (Fig. 19B). Petiole scales 15–25 × 2.5–3.5 mm, dark brown to blackish with pale brown to yellowish white margins 0.2–0.4 mm broad (Fig. 19A), marginal color transitional to central color in backlight.

Laminae to 55–140 × 27–90 cm, bipinnate-pinnatifid to tripinnate. Pinnae to 16–47 cm long, 8–10 pairs per frond, stalked to (0.3)0.5–1.6 cm, distally narrowly green-alate, distal segments simply adnate. Costae to 2.0–2.5 mm broad. Pinnules oblong-lanceolate, (20)47–65(80) × (6)11–17 mm, subsessile to short-stalked 1–3 mm, basally truncate to weakly cordate; basal segments never remote, sometimes weakly auriculate, segments ascending, distally straight, with rounded tips, margins crenulate to subentire, sometimes revolute and appearing entire, sinuses obtuse to acute, 0–2 mm wide; segments weakly hairy adaxially near the margins, the hairs multicellular, white, to 1 mm long, abaxially without hairs, with small appressed trichomidia on the veins abaxially, also with scurf remnants and some flat lanceolate to ovate, dark brown scales with fimbriate margins, to 2 mm long, distally with small subbullate squamules to 1 mm long. Sterile veins forked or simple, fertile veins forked.

Sori to 1.0 mm diameter, costal, in vein forks; indusia sphaeropteroid with umbo, pale brown and persistent, without small scale on top.

Distribution and habitat

Found on ridges and in long-lived clearings in montane forests at 2420–2830 m in southern Ecuador and northern Peru.

Differential diagnosis

*Cyathea meridensis* var. *nana* has quite a distinct appearance compared to var. *meridensis* and var. *obtecta*, because var. *nana* has smaller fronds and lacks the characteristic large triangular, stalked pinnules. However, the scales and fine indument of the petioles and laminae are congruent with the other two varieties. The small size of the plant with the subsequent reduction of pinna pairs (to 8–10 in var. *nana* vs. to 15–18 in var. *meridensis* and var. *obtecta*) is likely an adaptation to the ridge tops to which this variety is restricted. Its habit resembles that of a small *C. plicata*, a species that is common within the geographical range of *C. meridensis* var. *nana* and most probably closely related. *Cyathea plicata* can be separated from *C. meridensis* var. *nana* by its longer, narrowly lanceolate petiole scales and adaxially flat to weakly concave pinnules (vs. pinnules adaxially convex).

3.5.4 *Cyathea meridensis* var. *obtecta* **n. var.** (Figs. 3, 19C)

Type: Ecuador. **Zamora-Chinchipe**. Reserva Tapichalaca, Ventanillas, trail to study plots B2 and B3, 4°29'S, 79°07'W, 2550–2600 m, 3.II.2003, »Lehnert 1079« (holotype, GOET; isotypes, QCA, UC).

Paratypes: Ecuador. **Zamora-Chinchipe**. Nangaritza, Cordillera de Naguipa, Cerro Colorado, ridge 8 km SSE of Nambija, 20 km ESE of Zamora, 4°07'51"S, 78°46'36"W, 2630 m, 21.II.2006, »Cole et al. 261« MO, QCNE, UC); new road Loja–Zamora, ca. 4 km E of pass "El Tiro", ridge from white cross on left road side (towards the valley), 3°59'S, 79°08'W, 2500–2600 m, 11.X.2004, »Lehnert 1430« (GOET, QCA, UC). – Peru. **Amazonas**. Laguna de Pomacochas, 2550 m, 27.III.1998, »van der Werff et al. 15835« (MO, UC).

Description

A var. *meridensi* truncis humilioribus petiolis obtectis frondibusque supra vegetationem vecinam reptantibus differt.

Trunks to 0.3–2.0 m tall, to 11 cm diameter, erect, with persistent old petiole bases (Fig. 3); apices hidden in fascicles of petioles, unfolding only one frond at a time. Fronds to 190–340 cm long, supported by or draped on surrounding vegetation. Petioles to 50–200 cm long, inermous, dark brown to castaneous (Fig. 3), basally darker, distally often paler, stramineous to yellowish, on each side with a line of narrow, brown to rusty brown, inconspicuous pneumathodes. Petiole scales to 25 × 5 mm, lanceolate to ovate-lanceolate, concordantly to discordantly bicolorous (Fig. 3), variable, with dark brown to blackish centers and narrow orange to golden-brown margins; scurf dark brown to castaneous, a dense tomentum of trichomidia and oblanceolate squamellae with fimbriate margins, the margins appearing paler than the centers in backlight (Fig. 19C).

Laminae to 140 × 110–150 cm, bipinnate-pinnatifid to tripinnate. Pinnae to 55–75 cm long, stalked to (1.8)2.0–3.4 cm, distally narrowly green-alate, distal segments simply adnate to weakly decurrent. Pinnules long-triangular, to 120(130) × 22–38 mm, short to long-stalked 2–5 mm, basally truncate to weakly cordate; basal segments sometimes remote, connected by laminar tissue or free, margins crenulate to strongly crenate, sometimes revolute and

appearing entire, in basal segments sometimes weakly auriculate; segments ascending, distally weakly falcate, with obtuse to rounded tips, with obtuse to rectangular sinuses 1–3 mm wide, weakly hairy adaxially near the margins, the hairs multicellular, white, to 1 mm long, abaxially without hairs, with small appressed trichomidia on the veins abaxially, also with scurf remnants and some flat, lanceolate to ovate, yellowish to dark brown, fimbriate scales to 2 mm long. Sterile veins forked or simple, fertile veins forked.

Sori 1.2–1.4 mm diameter, subcostal, in vein forks; indusia sphaeropteroid with umbo, pale brown and persistent, without small scale on top.

#### Distribution and habitat

In dense shrub and understory of wet montane forests in Ecuador and northern Peru at 2500–2630 m.

#### Differential diagnosis

*Cyathea meridensis* var. *obtecta* matches the typical variety in the dissection and size of the fronds but has smaller trunks that retain the old petiole bases and remain in the understory of the forests. It is restricted to southern Ecuador and northern Peru, and presumably represents a regional growth form adapted to the special climatic conditions of this area (Killeen et al. 2007). This variety of *C. meridensis* is superficially similar to *C. gracilis* Griseb., which can be found in the same area. The latter species grows mainly epiphytically and therefore also develops a small trunk with relatively long, drooping fronds, like those of *C. meridensis* var. *obtecta*. Both species differ mainly in the petiole scales (bicolorous blackish with orange margins in *C. meridensis* var. *obtecta* vs. concolorous dull brown in *C. gracilis*), color and abundance of petiole scurf (persistent, dense, and dark brown to castaneous vs. absent or ephemeral, pale brown to whitish), and soral position (subcostal to costal vs. submedial). *Cyathea ebenina* H. Karst. is another similar species with thin trunks; it has bicolorous scales like *C. meridensis* but agrees with *C. gracilis* in the soral position. It can be distinguished from both *C. meridensis* and *C. gracilis* by the black rhachises and costae that strongly contrast with the green costules (vs. not contrasting in the other two species). *Cyathea ebenina* also has more linear-lanceolate pinnules and never has the basal pinnule segments free or remote (vs. often triangular and with remote basal segments).

#### 3.5.5 Key to the varieties of *Cyathea meridensis*

**1** Fertile fronds to 1.5 m long, with 8–10 pinna pairs; all pinnules sessile, to 65(–80) mm long; trunks to 1.5 m tall, covered with persistent petiole bases. . . . . var. ***nana***

– Fertile fronds more than 1.5 m long, with 12–15 pinna pairs; largest pinnules notably stalked, to 120–130 mm long; trunks to 3–10 m tall, petiole bases persistent or not. . . . . **2**

**2** Fertile fronds leaning and draped over adjacent vegetation; trunks relatively small compared to the frond length, 0.3–2.0 m tall, petiole bases persistent, rotting off only in older plants. . . . . var. ***obtecta***

– Fertile fronds hanging free, arching to distally drooping; trunks to 10 m tall, without persistent petiole bases, petioles cleanly falling off at an early age. . . . . var. ***meridensis***

### 3.6 *Cyathea plicata*

*Cyathea plicata* Lehnert: Lehnert 2006a: 6. – Type: Ecuador. Zamora-Chinchipe, Estación Cientifica San Francisco, disturbed areas (pastures, fields remnants of forests) above the station, 3°57'48"S, 79°04'12"W, 2290 m, 14.IX.2003, »Lehnert 844« (holotype, GOET; isotypes, LOJA, QCA, UC).

#### Selected specimens examined

Ecuador. **Loja**. New road Loja–Saraguro, km 17, 3°55'S, 79°15'W, 2600–2650 m, 20.III.1993, »Øllgaard & Feil 91113« (AAU, QCA, QCNE). **Napo**. Oyacachi, E of village, 0°13'N, 78°02'W, 2900 m, 29.X.1999, »Øllgaard & Navarrete 1296« (QCNE). **Sucumbios**. Cartagena, km 25 from El Carmelo on road towards La Bonita, 0°37'N, 77°30'W, 2800 m, 14.IV.1983, »Løjtnant et al. 12330« (AAU). **Zamora-Chinchipe**. Chinchipe, La Esmeralda, cooperativa San Francisco de Numbala Alto, 4°22'S, 79°03'W, 2300 m, 2.II.1999, »Palacios & Tirado 13120« (UC).

Peru. **Amazonas**. Chachapoyas, Carretera Chachapoyas–Mendoza, km 52 de Chachapoyas, 10 km detrás de Molinopampa, 6°14.26'S, 77°35.96'W, 2700 m, 4.VIII.2002, »Lehnert 240« (GOET, UC, USM). **Cajamarca**. San Miguel, Tongo Alto, following the route to Tongod, 2650 m, 16.IX.1995, »Sanchez-Vega & Briones 5807« (UC).

#### Description

Trunks to 3 m tall, to 12–16 cm diameter, erect and straight, not covered by old petiole bases. Petioles to 25 cm long, scabrous to finely muricate at bases, with caducous scurf of brown squamellae with strongly crispate margins. Petiole scales long-lanceolate with elongated tips, to 50 × 3.6 mm, nearly concolorous orange-brown to bicolorous with orange-brown to castaneous centers and orange to whitish narrow margins.

Laminae to 105–165 × 60–70 cm. Pinnae alternate, to 40 cm long, sessile to short-stalked (2 cm), acute to short-attenuate at tips. Pinnules linear-lanceolate, 1.0–1.5 × 3.0–7.0(8.0) cm, sessile or rarely short-stalked, the bases truncate to weakly cordate, tips short-acute; pinnules turned upwards with respect to the costae and often twisted towards the rhachis, especially in the proximal half of the pinnae.

Sori inframedial to costal, at vein forks; indusia sphaeropteroid, without umbo.

For full description see Lehnert (2006a).

### Distribution and habitat

Wet montane forests at 2050–2900 m in Ecuador and northern Peru. Preferentially in dwarfed vegetation and forest clearings, fertile only in full sun.

### Remarks

This distinctive species is recognized by the furrowed pinnae and relatively short fronds. The upward pointing pinnules can be detected in herbarium specimens because the pinnae are impossible to flatten without breaking off the pinnules, so they are normally folded in dried specimens. This species probably belongs to the *C. meridensis* group, whose members have similar scurf and laminar texture. However, the pinnules are held horizontally in the species of the *C. meridensis* group and they also have more strongly bicolorous and shorter scales than in *C. plicata*. The circularly swollen junctions of rhachises and costae in *C. meridensis*, *C. carolihenrici*, and *C. plicata* are shared with some other *Cyathea* species with sphaeropteroid indusia, such as *C. cystolepis* Sodiro and *C. divergens* Kunze, but the significance of this character considering relationships is still uncertain.

## 3.7 *Cyathea squamipes*
(Figs. 6, 8, 20)

*Cyathea squamipes* H. Karst.: Karsten 1860: 199. – Type: Venezuela. Mérida, 1000–1500 m, »Karsten s. n.« (holotype, W, n. v., W-photo, -fragm. BM; isotype B).

*Cyathea lepidopoda* C. Chr.: Christensen 1905: 193, nom. superfl.

*Cyathea mexicana* Schldtl. & Cham. var. *boliviensis* Rosenst.: Rosenstock 1928: 56. – *Cyathea caracasana* (Klotzsch) Domin var. *boliviensis* (Rosenst.) R. M. Tryon: Tryon 1976: 77. – Type: Bolivia. La Paz, "Hacienda Sumaco supra Tipuani", »Buchtien 5140« (holotype, n. l.; isotypes, F, GH, NY, US).

### Selected specimens examined

C o l o m b i a . **Antioquia**. Campamento, km 10–15 de la via Campamento-Las Brisas, 1570–1800 m, 20.VIII.1986, »Callejas et al. 2516« (GH, NY); Jardin, carretera hacia la selva, Alto de la Cruz, 2040 m, 12.VI.2004, »Giraldo & Mejia 2140« (COL). **Cundinamarca**. San Bernardo, Cordillera Oriental, Vereda Santa Rita, Hacienda El Placer, 2180 m, 28.VII.1985, » Jaramillo Mejia et al. 7181« (COL). **Risaralda**. Mistrato, Corregimiento de Jueguadas, 5°26'N, 76°02'W, 1500 m, 28.III.–2.IV.1992, »Betancur et al. 3256« (COL). **Santander**. Mesa de los Santos, 1500 m, 11.–15.XII.1926, »Killip et al. 15088« (US). **Valle de Cauca**. Above Finca La Mesita, W of Villa Colombia, E slope of Cordillera Occidental, 3°08'N, 76°40'W, 1900–2100 m, 28.III.1987, »Gentry et al. 40904« (COL).

V e n e z u e l a . **Mérida**. Between Antimano and Agua Negras, 900–1500 m, »Pittier 6016« (B). **Prov. unknown**. 1889, »Engel 137« (B).

E c u a d o r . **Cañar**. Vicinity of Huigra, mostly on the Hacienda de Licay, 8.IX.1918, »Rose & Rose 22605« (US). **Carchi**. Ca. 6 km above Maldonado, just below Puente de Palo, 0°54'N, 78°06'W, 2275 m, 23.V.1993, »Boyle & Bradford 1892« (MO). **Morona-Santiago**. Limón Indanza, region of Cordillera del Cóndor, Santa Susana de Chiviaza, W of Río Zamora, Cerro Chiviaza, 2°55'22"S, 78°22'18"W, 1150 m, 24.III.–3.IV.2006, »Reyes & Morales 1092« (MO, UC). **Pichincha**. Mindo Biological Station, 0°04.7'S, 78°43.9'W, 1550 m, 13.X.2006, »Lehnert 966« (GOET, QCA, UC). **Sucumbios**. Río Bermejo to Cerro Sur Pax, Cofan community of Alto Bermejo, access from Bermejo oil filed road to Pozo 2, NW between Lumbaqui and Cascales, vicinity of Oso Ridge Camp, 0°19'17.7"N, 77°25'10.0"W, 1700–1920 m, 3.VIII.2005, »Aguinda et al. 1239« (UC). **Tungurahua**. Baños, expanded area of Llanganatis National Park, Machay, Río Verde, Colina San Augustin, 1°22'S, 78°17'W, 2090 m, 1.–3. VIII.1999, »Vargas et al. 3751« (UC). **Zamora-Chinchipe**. Estación Cientifica San Francisco, areas intervenidas (pastizales, campos y remnantes del bosque) arriba de la estación, 3°57'48"S, 79°04'12"W, 2420 m, 15.IX.2007, »Lehnert 845« (GOET, QCA, UC); in the vicinity of the mining camp at the Río Tundaime, along road to military base El Condor, 3°38'S, 78°25'32"W, 1500 m, 7.XI.2008, »van der Werff et al. 19368« (UC).

P e r u . **Amazonas**. Bagua, third camp, Cordillera Colán SE of la Peca, 2100–2300 m, 11.X.1982, »Barbour 3921« (US); around Laguna Pomacochas, 5°50'11"S, 77°57'47"W, 2250 m, 21.III.2002, »van der Werff et al. 15256« (UC). **Cajamarca**. San Ignacio, Dist. San José de Lourdes, Picorana, 4°58'00"S, 78°53'01"W, 2350–2450 m, 4.XII.2002, »Campos et al. 5907« (UC). **Cuzco**. Calca, Dist. Lares, Suyo, 10°28'S, 72°00'W, 2831 m, 17.VI.2005, »Valenzuela et al. 5717« (MO); Urubamba, Dist. Machu Picchu, Cedropata (Collpani), 13°06'S, 72°38'W, 2550 m, 8.XI.1997, »Chávez Huamán 1008« (AAU). **Huanuco**. Southwestern slope of the Río Llulla Pichis watershed, on the ascent of Cerros del Sira, in a valley beyond Camp 4, 9°25'S, 74°44'W, 1540 m, 25.VII.1969, »Dudley 13276« (GH). **Pasco**. Oxapampa, Abra Villa Rica, 10°40'36"S, 75°18'55"W, 2400 m, 25.VIII.2004, »Mellado 1573« (MO). **San Martin**. Huallaga, al norte de La Morada, 2400–2500 m, 14.VIII.2001, »Quipuscoa et al. 1032« (UC).

B o l i v i a . **Cochabamba**. Carrasco, 136 km antigua carretera Cochabamba–Villa Tunari, 17°07'S, 65°35'W, 1550 m, 29.VIII.2000, »Kessler et al. 7871« (GOET, LPB, UC). **La Paz**. Serrania Bella Vista, entre Caranavi y Palos Blancos, ca. km 40.1, 15°40'S, 67°24'W, 1550 m, 15.VIII.2004, »Lehnert 25« (GOET, LPB, UC).

### Description

Trunks to 15 m tall, perhaps taller, to 10–16 cm diameter, without old petiole bases when crown exposed or trunk taller than frond length, trunk apices hidden in fascicles of petioles (Figs. 6, 8), frond scars gray or light brown, oval and well spaced in lower parts, tightly packed and rhomboid in upper parts (normally from 3–4 m height), adventitious buds absent although trunk may be forked with 2–5 separate crowns after injuries. Petioles to 110 cm long, young ones green but usually covered with a dense brown scurf, becoming brown to dark brown with age, verrucate-muricate to aculeate with corticinate spines to 4 mm long, spines with a scale on top in crosiers and young fronds; scurf persistent, consisting of crested, erect, brown to dark brown squamules 0.1–0.6 mm long (Fig. 20B), not cleanly abraded. Petiole scales to 15 × 4 mm, atropurpureus to blackish on the sides and the bases of the

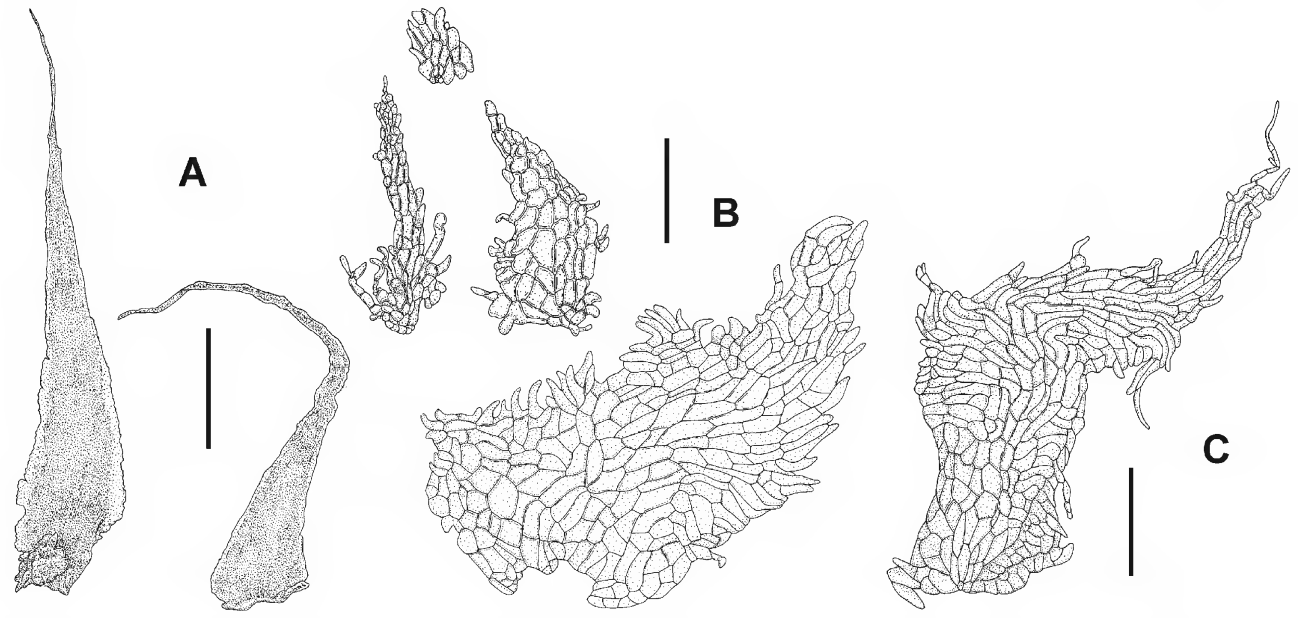


**Fig. 20.** *Cyathea squamipes* (all from »Jiménez 1014« UC). – **A**. Petiole scales. **B**. Squamules of petiole scurf. **C**. Laminar squamule. – Scales: 5 mm (A), 0.2 mm (B, C).

petioles, dark brown on distal petiole parts and the undercover, always with distinct lighter margins (Fig. 20A), brown to orange, rarely yellowish or cream-white.

Laminae to 270 × 90 cm, bipinnate-pinnatifid, lustrous dark green above, paler below, when dried characteristically black adaxially, grayish abaxially, apices gradually reduced. Rhachises brown to castaneous, becoming stramineous or grayish apically, often pruinose adaxially. Costae and costules shortly hairy with antrorse multicellular hairs to 1 mm long adaxially, glabrescent abaxially, with crested brown squamules abaxially (Fig. 20C), especially long-lasting in the axils of the costae. Pinnae short-stalked, acuminate, distally green-alate, the wings arcuate. Pinnules sessile to short-stalked (1–2 mm in the basal ones), linear, acuminate from ¾ of the total length, fertile and sterile segments planar, segment margins subentire, crenulate at the tips, with short hairs on the veins abaxially, sometimes also between them below the sinuses, glabrous adaxially or sometimes with one or two white hairs on the midveins distally, with few to many orange to tan, flattish and bullate scales abaxially on the costules and midveins (rarely abundant or lacking). Sterile veins simple or forked; fertile veins forked.

Sori costal, at vein forks; indusia sphaeropteroid, glabrous, tan and lustrous, with dark apical or slightly lateral umbo, rupturing irregularly at maturity, but persisting as deep cups or urns, usually including the umbo; paraphyses of same length as the sporangia, hyaline. Spores deep yellow, trilete, exospore verrucate, perispore baculate.

Distribution and habitat

Colombia, western Venezuela, Ecuador, Peru, and Bolivia at (900)1400–2800(3000) in moist montane forests, often persisting in cleared areas.

Remarks

*Cyathea squamipes* is represented mainly by specimens previously recognized as *C. caracasana* var. *boliviensis* (Rosenst.) R. M. Tryon. Distinguishing characters of *C. squamipes* are its dark brown to blackish petiole scales with narrow margins, the persisting petiole scurf, and its orange-brown, bullate squamules on the laminae. The similar *C. delgadii* Sternb. and *C. herzogii* share bullate squamules but have concolorous brown to orange-brown petiole scales, and have evanescent scurf or no scurf at all.

*Cyathea squamipes* differs significantly from *C. caracasana* in the type of scurf squamules found on the whole fronds. While *C. caracasana* and allies (i. e., *C. crenata*, *C. meridensis*, *C. carolihenrici*, and *C. plicata*) have dark brown to castaneous, pulverulent scurf, *C. squamipes* has round to ovate, often orange-brown squamules with crispate margins, which are erect on the petiole and often bullate on the laminae abaxially. This type of squamule, together with more abundant multicellular hairs than in the *C. caracasana* group, relates *C. squamipes* to the *C. fulva* group. The *C. fulva* group sensu Tryon (1976) is probably a natural group of species characterized by dull brown to

orange-brown petiole scales and scant to ephemeral petiole scurf; the abundance and distribution of hairs, as well as the presence of bullate squamules on the laminae, are the most important characters in distinguishing species but apparently they may also vary greatly within a species.

The widespread and common *Cyathea delgadii* of the *C. fulva* group is very close to *C. squamipes* in every aspect. In the central Andes, they often grow close together in large numbers, they have the same appearance and stature, and their spores are indistinguishable. Their laminar dissection is also similar; however, *C. delgadii* never has the basal segments of the largest pinnules separated as much as *C. squamipes*. The veins are abaxially hairy in both species, but only *C. delgadii* regularly has many hairs between the veins abaxially, or on the veins adaxially. The adaxial laminar surface of *C. squamipes* is nearly glabrous except for the densely hairy costules and costae, and sometimes single hairs on the segments' midveins. Also, the hairs are longer in *C. delgadii* (ca. 1 mm) than in *C. squamipes* (0.4–0.6 mm). Plants in the field or specimens with petioles can be readily distinguished: because of long persisting scurf and mainly castaneous scales on the petiole, the trunk apices of *C. squamipes* appear ruddy and dusky. The brighter, concolorous orange-brown scales of *C. delgadii* persist only at the sides of the petiole; the normally weakly developed scurf is soon caducous, revealing the brown to blackish, shiny cortex of the petiole bases. Thus *C. delgadii* appears more colorful and contrasting in the field than *C. squamipes*.

Two species are morphologically much closer to *C. squamipes* than to the other species in the *C. caracasana* complex (Tryon 1976), namely *C. catacampta* and *C. lindeniana*. *Cyathea squamipes* is intermediate between the two in many characters, e. g., scale size, width of differently colored scale margins, and hairiness of laminae. Some specimens of *C. squamipes* tend more to *C. catacampta*, having larger petiole scurf squamules than typical *C. squamipes* but having the typical dark, broad petiole scales (»Lehnert & Lopez 483«, »Lehnert 845, 1469«, »Jiménez 1537«). »Lehnert 1469« resembles more *C. lindeniana*, with remote segments and dark laminar color, but scurfiness and scale color fit better in *C. squamipes*. The three morphospecies may represent stabilized hybrids between members of the *C. caracasana* group and the *C. fulva* group. Typical characters of the *C. caracasana* group found in *C. squamipes* and allies are the persistent, dark brown scurf, tendency towards glabrousness, and relatively short hairs. Furthermore, *C. squamipes* and *C. lindeniana* often have triangular, notably stalked pinnae and dark green laminae, and in this point especially resemble *C. meridensis* and *C. carolihenrici* of the *C. caracasana* group. Traits that relate to the *C. fulva* group (among these species especially to *C. delgadii*) are sessile pinnules, reddish to orange-brown color in the indument and variability in the hairiness, which are evident in *C. catacampta*, and the tendency to weakly developed scurf and concolorous petiole scales, which are more pronounced in *C. lindeniana*. Future molecular work and phenological field studies should focus on this group in order to evaluate the possible existence of hybrid complexes.

### 3.8 *Cyathea lindeniana*
(Figs. 11–12)

*Cyathea lindeniana* C. Presl: Presl 1849: 30. – Type: Colombia. "Nova Granada, Prov. Maraquita", »Linden 1022« (holotype, n. l.; isotypes, B [fragm. ex Herb. Mett.], BM?, BR n. v., K, US).

*Cyathea grenadensis* Trevis.: Trevisan 1851: 164, nom. nud. (fide Tryon 1976), »Linden 1022« was cited.

Selected specimens examined

Colombia. **Antioquia**. Belmira, Páramo Sabanayo, Estación Ecológica "El Refugio", 3100 m, 15.V.1996, » Gómez R. F. et al. 5997« (F). **Chocó**. Cerro del Torre, vertiente NE, 1900–1940 m, 11.VIII.1982, »Silverstone-Sopkin 1294« (AAU, MO). **Cundinamarca**. Tabio, Cordillera Oriental, Vereda La Juaica, 3000 m, 25.III.1965, »Huertas & Camargo 4472« (COL). **Huila**. At camp of Gaucho, Cordillera Oriental, N of Palacio, about 20 km NE of Santa Ana, ca. 2530 m, 24.II.1948, »Little 7332« (COL). **Santander**. Sarare, Alto del Mirador, 1800–2100 m, 19.III.1963, »Bishler 2111« (COL, NY). **Valle de Cauca**. Km 19 on road from Cali to Buenaventura, 4.VIII.1976, »Barrington 498« (COL).

Venezuela. **Mérida**. La Cuchilla, 20 km W of Mérida on road to La Azulita, 2300 m, 16.IX.1965, »Tryon & Tryon 5773« (UC). **Tachira**. Junín, S slopes of Cerro San Isidro, directly N of El Reposa, above Hacienda Bella Vista, Quebrada Agua Caliente and tributaries, 7°34'N, 72°25'W, 2200–2450 m, 13.–14.XI.1982, »Davidse & González 22174« (UC). **Lara**. Morán, road Humacaro Alto to Guaito, 1800 m, 30.I.1991, »van der Werff & Rivero 8761« (UC).

Ecuador. **Carchi**. Río San Juan Valley, 4 h walk below Chical, at Ortiz ranch between Peñas Blancas and El Pailán, known locally as Goaltal, 1°02'N, 78°15'W, 1230–1250 m, 10.VI.1993, »Boyle et al. 1998« (MO). **Napo**. Cordillera de los Guacamayos, ca. 6 km SE of Cosanga, 0°38'S, 77°50'W, 1940 m, 5.X.2006, »Homeier 2370« (GOET, QCA). **Zamora-Chinchipe**. Estación Cientifica San Francisco, trail "antajo", 3°58'S, 79°04'W, 1800 m, 9.XI.2007, »Lehnert 1091« (GOET, QCA, UC).

Peru. **Cajamarca**. Lower edge of Cutervo National Park, 10–15 km N of San Andres de Cutervo, 6°10'S, 78°40'W, 2200 m, 13.II.1992, »Gentry et al. 61560« (UC). **San Martin**. Rioja, entre Pedro Ruiz y Rioja, 5°47.17'S, 77°58.20'W, 2000 m, 21.VII.2002, »Lehnert 198« (GOET, UC, USM).

#### Description

Trunks to 7(–10) m tall, to (7.5)9.0–12.0 cm diameter, without old petiole bases; upper parts covered in concolorous scales, similar to petiole scales; frond scars elliptic, in upper parts of taller trunks circular, not rhomboid, inconspicuously gray, with small, round, vermillion lenticels

below them; trunk apices hidden in fascicles of petioles (Fig. 12); adventitious buds lacking. Fronds to 200–350 cm long, arching, distally drooping, but not to the ground (Fig. 11). Petioles to 100 cm long, dark brown to atropurpureous, rarely basally blackish, verrucate to muricate, rarely with short spines to 2 mm long; adventitious (aphlebioid) pinnae lacking; petiole scurf weakly developed, persistent, concolorous orange-brown to dark reddish brown, consisting of erect, lanceolate, ovate, and round squamules 0.5–1.0 mm long, with fimbriate to crested margins but without dark marginal teeth, usually leaving cortex visible, long-lasting, abraded only in inermous petiole parts, basal parts of squamules persisting. Petiole scales narrowly lanceolate to lanceolate, (15.0)20.0–33.0 × 3.5–4.5 mm, tips straight to falcate, weakly undulate, the brown to dark brown centers not sharply delimited against the brown to orange margins, often appearing concolorous, usually lustrous (Fig. 12).

Laminae to 250 × 160 cm, bipinnate-pinnatifid to tripinnate, firmly herbaceous to chartaceous, brodest in the middle, apices gradually reduced and long drooping (Fig. 11); dark green adaxially, usually blackish when dried, bright green abaxially. Pinnae to 60–75 cm long, 12–15 pairs per frond, stalked to (0.6)1.4–3.0(5.0) cm, distally narrowly green-alate, the distal segments simply adnate. Leaf axes brown to atropurpureous, rarely abaxially stramineous with brownish tinges and streaks, hairs only adaxially on costules, costae, and distal parts of rhachises, hairs 0.5–1.0 mm long, whitish to tan, abaxially glabrescent with sparse tan to brown scurf consisting of small squamules 0.2–0.6 mm long, similar to those on the petioles, shortly fimbriate to entire, persisting at junctions of costae with costules and rhachises, costae inermous, rarely more than 3 mm broad, junctions of costae and rhachises abaxially swollen, each with one planar pneumathode to 3 × 2 mm, brown to dark brown, inconspicuous. Pinnules to (10.0)11.0–12.5 × 1.6–3.2 cm, subsessile to stalked 1.0–4.0(6.0) mm, alternate, (0.5)1.0–2.5 cm between the stalks, long-triangular to lanceolate, truncate at base, tapering from below the middle (rarely in large pinnules from the base) to acute to attenuate tips, segments ascending, weakly falcate in large pinnules, with crenulate to crenate margins and round or obtuse tips, basal segments alternately placed, sometimes remote from each other, sinuses (1)2–4 mm wide, acute to rectangular; sterile and fertile pinnules not different. Veins glabrous abaxially except for few occasional white to tan, erect multicellular hairs on the midveins distally, with variously developed scurf, white unicellular trichomidia, small flattish, brown, ovate squamules with elongated tips and finely dissected margins, midveins sometimes with brown bullate squamules; sterile veins forked or simple, fertile veins forked.

Sori to 1.0(–1.5) mm diameter, subcostal to costal, at vein forks, indusia sphaeropteroid, with umbo, tan, translucent, fragments persisting; receptacles globose, 0.2–0.3 mm diameter, paraphyses few, hyaline, tan, shorter than sporangia (0.3 mm). Spores pale yellow, perispore not examined.

Distribution and habitat

Colombia, western Venezuela, Ecuador, and Peru; along rivers and creeks, in moist montane forests at 1250–3100 m.

Remarks

*Cyathea lindeniana* is one of the three species recognized here that fall into Tryon's (1976) concept of *C. caracasana* var. *boliviensis*. *Cyathea lindeniana* differs from *C. squamipes* and *C. catacampta* in the weak development of laminar indument and the regular presence of petiolulate triangular pinnules, which are less common in the other two species. Among these three, it also has the most delicate appearance, with erect, slender trunks 9–12 cm in diameter and long-arching to drooping fronds. *Cyathea catacampta* and *C. squamipes* have stouter trunks to 15–20 cm in diameter and more patent fronds. The slimmer appearance of *C. lindeniana* may be an adaptation to its preferred habitat, with plants growing mainly in shaded understory near rivers and in gorges. The fact that the plants retain this habit even with increased exposure to sun after clearing (observed in southern Ecuador and northern Peru) indicates that *C. lindeniana* is not a mere ecotype of *C. squamipes*, which is common within the geographical range of *C. lindeniana*. The petiole scales of *C. lindeniana* are less contrastingly colored than in *C. squamipes* or *C. catacampta* and are almost concolorous in some parts of the petioles. When only concolorous petiole scales are preserved in specimens, *C. lindeniana* may be mistaken for *C. delgadii* or one of its allies that have concolorous orange-brown scales. These species are, however, commonly much hairier than *C. lindeniana*, having many hairs abaxially on the veins and often also between them.

### 3.9 *Cyathea catacampta*
(Figs. 7, 9–10)

*Cyathea catacampta* Alston: Alston 1958: 231. – Type: Colombia. Nariño, between Río Miraflores and Río San Martin, Volcán de Cumbal region, 2680 m, 12.–13.VII.1944, »Ewan 16153« (holotype, BM; isotype, US).

Selected specimens examined

Colombia. **Antioquia**. Bello, 4.7 km above Medellin–San Pedro road, on road to radio tower at summit, 6°22'N, 75°39'W, 2760 m, 12.XI.1992, »McPherson 13038« (COL). **Cauca**. Cerro Munchique, south slopes, 40 km W of Popayan, 2700 m, 17.X.1965, »Tryon & Tryon 6009« (COL, UC); El Tambo, 2900 m, VII.1948, »Yepes-Agredo 431« (COL). **Cundina-**

**marca**. Manta, portrero Cielo Roto, 5°00'45"N, 73°32'35"W, 2400–2600 m, 9.VI.1999, »Sánchez-Baracaldo 3, 4« (UC). **Nariño**. Camino to Mayasquer below "Tambo" NW slope of Volcán Chiles, 2740 m, 31.VIII.–1.IX.1944, »Ewan 16012« (UC). **Risaralda**. Santuario, Vereda Las Colonias, 200 m arriba del campamento, 2740 m, 2.II.1987, »Torres et al. 1409« (COL). **Santander**. Charalá, Inspección Viroin, Vereda el Volcán, 1900 m, 1.VII.1987, »Torres 2579« (COL).

Ecuador. **Loja**. Trails ca. 5 km ENE of San Pedro de Vilcabamba, from "El Bosque" to Quebrada Romerillos and Banderilla, 4°14'S, 79°10'W, 2000–2200 m, 1.XII.1998, »Øllgaard & Navarrete 105965« (AAU, QCA). **Morona-Santiago**. Road Plan de Milagro-Gualaceo, km 34.3, 3°01'S, 78°39'W, 3000 m, 21.III.2001, »Øllgaard & Navarrete 2542« (AAU, QCA). **Zamora-Chinchipe**. Reserva Tapichalaca, garden area of the station "Casa Simpson", 4°29'S, 79°07'W, 2450 m, 4.XI.2007, »Lehnert 1082« (GOET, QCA, UC).

Peru. **Amazonas**. Chachapoyas, carretera Chachapoyas-Mendoza, km 51 de Chachapoyas, 9 km detrás de Molinopampa, 6°14.26'S, 77°35.96'W, 2700 m, 4.VII.2002, »Lehnert 227« (GOET, UC, USM). **Cuzco**. Urubamba, bottom of Río Urubamba Canyon at Puente Ruinas (Machu Picchu) railrad station, 2000 m, 4.I.1967, »Iltis et al. 1025« (UC); entre San Luis y Abra Malaga, 3050 m, 16.X.2002, »Lehnert 427« (GOET, UC, USM).

Bolivia. **La Paz**. Franz Tamayo, ANMI Apolobamba, sector Laitiki crossing the bridge between Pelechuco and Apolo, 14°36'53"S, 69°00'49"W, 2600 m, 20.IV.2006, »Fuentes et al. 10397« (LPB, UC); Nor Yungas, 8.5 km NE (below) Chuspipata, 16°16'S, 67°47'W, 2400 m, 20.X.1986, »Solomon 8492« (AAU, LPB, MO, NY, UC).

## Description

Trunks straight, erect, to 14(–21) m tall, to 15–20 cm diameter, without old petiole bases, upper parts covered in concolorous to bicolorous scales, similar to petiole scales, frond scars elliptic, in upper parts of larger plants rhomboid, not circular, pale brown to gray, with small round vermillion lenticels below them; trunk apices hidden in fascicles of petioles (Fig. 10); adventitious buds lacking. Fronds to (150)200–295 cm long, arching (Fig. 7). Petioles to 50–75(100) cm long, muricate to strongly aculeate, spines to 5 mm long, dark brown to atropurpureous, basally darker but rarely blackish, distally paler, sometimes stramineous, without adventitious (aphlebioid) pinnae at the petiole bases, petiole scurf well developed, concolorous orange-brown to dark reddish brown, consisting of erect lanceolate, ovate to round squamules 0.5–1.5 mm long, with fimbriate to crested margins but without dark marginal teeth, usually leaving cortex visible, long-lasting, abraded only in inermous petiole parts, basal parts of squamules usually persisting. Petiole scales narrowly lanceolate to lanceolate, 20.0–35.0 × (1.5)3.4–4.5 mm, usually lustrous, their tips straight, undulate or twisted, varying from nearly concolorous dark brown to concordantly bicolorous with the brown to blackish centers sharply set against the reddish brown to orange margins, the aristate tips similarly lighter.

Laminae to 150–230 × 110–130 cm, broadest in the middle, bipinnate-pinnatifid, firmly herbaceous to chartaceous, dark green adaxially, blackish to plumbeous when dried, bright green abaxially, apices gradually reduced, rather short and not drooping. Pinnae to 65 cm long, 15–20(25) pairs per frond, stalked to 0.6–1.0(2.0) cm (Fig. 7), distally narrowly green-alate, the distal segments simply adnate. Leaf axes stramineous to brown, rarely darker, costules, costae, and distal parts of rhachises adaxially hairy, hairs 0.5–1.0 mm long, whitish to tan, abaxially sparsely hairy with white erect hairs to 0.6 mm or glabrous, with sparse to dense orange-brown to brown scurf consisting of small squamules 0.2–0.6 mm long, similar to those on the petioles; rhachises often with long-persisting scales adaxially and at the junctions with the costae, often with the scale margins cretaceous white (Fig. 9), junctions of costae and rhachises abaxially swollen, each with a dark brown to blackish spot and with planar, pale brown pneumathodes, either one to 6 × 3 mm, or two, each 2–3 × 2 mm. Pinnules to 9.0–13.0 × 1.4–2.2(2.8) cm, the largest ones sessile to subsessile (0.5–1.0 mm), alternate to opposite (Fig. 9), 1.5–2.0 cm between the stalks, linear-oblong, truncate at base, tapering from beyond the middle to acute or attenuate tips, segments ascending, weakly falcate distally, with crenulate to crenate margins and rounded to obtuse tips; basal segments opposite, never remote from each other, sinuses 1–2(3) mm wide, obtuse to acute, scurf variously developed abaxially on costules, midveins and lateral veins, consisting of white to tan, unicellular trichomidia and small, flat to bullate, orange-brown, ovate squamules with elongate tips and finely dissected margins; sterile and fertile pinnules not different. Veins glabrous adaxially except for an occasional white to tan, erect multicellular hairs on the midveins distally, sparsely to densely hairy abaxially, glabrous to sparsely hairy between them; hairs white, erect, multicellular, to 0.6(–1.0) mm long; sterile veins forked or simple, fertile veins forked.

Sori 1.0(–1.5) mm diameter, subcostal to costal, at vein forks, indusia sphaeropteroid, with umbo, tan, translucent, fragments persisting; receptacles globose, 0.3–0.4 mm diameter, paraphyses few, hyaline, tan, shorter than sporangia (0.3–0.5 mm). Spores yellow, perispore not examined.

## Distribution and habitat

Colombia, Ecuador, Peru, and Bolivia at 1900–3050 m in moist montane forests and humid localities in semideciduous forests, with a preference for open sites, sometimes in pastures.

## Remarks

*Cyathea catacampta* is characterized by its broad, sessile pinnules, the scaly rhachises, and the relatively narrow basal petiole scales with reddish brown to orange margins. The scales on the abaxial sides of the petioles are smaller

but more strongly bicolorous than those in the other parts of the petioles. Populations in the northern Andes have more colorful scales than those of the central Andes; plants from Bolivia have mostly concolorous scales. In all their variability, the petiole scales of *C. catacampta* are distinguished from those of *C. squamipes* by having the marginal color continued into the tips, which leads to a dominance of reddish brown in the indument; in *C. squamipes*, the scale tips are concolorous dark brown to blackish like the centers of the scales. Another distinguishing feature of *C. catacampta* are the sparser but larger (to 1 mm long), more reddish brown squamules of the petiole scurf; the scurf of *C. squamipes* appears as a dense, pale brown to castaneous cover (depending on humidity) consisting of smaller squamules (on average 0.5 mm long).

*Cyathea frondosa* from the northern Andes is similar to *C. catacampta* in its habit and may be mistaken for this species from some distance, but is easily distinguished by its scurf (grayish white to whitish brown, highly dissected appressed squamules vs. reddish brown, erect squamules with crested margins in *C. catacampta*) and the presence of adventitious pinnae near the petiole bases (vs. always absent).

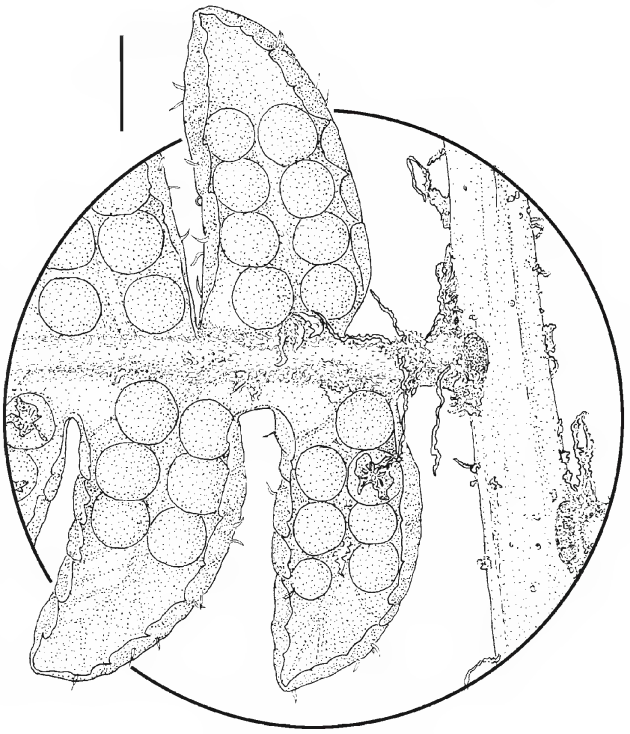

**Fig. 21.** *Cyathea maxonii*, fertile segments (»Bittner 1194« B). – Scale: 1 mm.

### 3.10 *Cyathea maxonii*
(Fig. 21)

*Cyathea maxonii* Underw. ex Maxon: Maxon 1909: 82. – *Cyathea caracasana* var. *maxonii* (Maxon) R. M. Tryon: Tryon 1976: 83. – Type: Costa Rica. Cartago, 5 miles S of Cartago, »Maxon 524« (holotype, NY; isotypes, B, US).

Selected specimens examined

C o s t a R i c a . **Alajuela**. San Ramón, Cerro Azar, 1600 m, 14.V.1983, »Pérez-García et al. 452« (UC). **Cartago**. Cantón Paraiso, investigation area of the CATIE, 9°33'30"N, 83°41'30"W, 2630 m, »Bittner 1194« (B). **Heredia**. Headwaters of Río Santo Domingo, ca. 3 km E of San Rafael de Vara Blanca, N slope of Volcán Barva, 10°11'N, 84°07'W, 2060–2080 m, 15.IV.1986, »Grayum et al. 7126« (UC). **Limón**. National Park Braulio Carrillo, transect trail between OTS-Station La Selva and Volcán Barva, 1200 m, 4.X.2006, »Kluge 3502« (GOET). **Puntarenas**. Upper Río Burú, 2010 m, 20.VIII.1987, »Gómez L. D. et al. 21771« (AAU). **San José**. 10 km N of San Rafael de Heredia on Volcán Barva, 1950 m, 20.VII.1967, »Mickel 3008« (UC).

P a n a m a . **Chiriqui**. Canal Zone, between Alto de las Palmas and top of Cerro de Horqueta, 2100–2268 m, 18.III.1911, »Maxon 5508« (BM).

Description

Trunks to 10–12 m tall, to 10 cm diameter, without old petiole bases, frond scars oval to round, 2.5–3.0 cm long, well spaced in lower parts (to ca. 2 m height), crowded in upper parts, trunk apices hidden in fascicles of petioles, with glossy, dark castaneous, bicolorous lanceolate scales with pale margins, similar to petiole scales, adventitious buds lacking. Petioles to 35–45(100) cm long, inermous to weakly aculeate, pale brown to dark brown, rarely stramineous, without adventitious (aphlebioid) pinnae at the bases, petiole scurf dense but soon caducous, concolorous brown to dark orange-brown, consisting of erect to appressed, lanceolate, ovate, and round squamules 0.2–0.5 mm long, with crested to fimbriate margins but without dark marginal teeth. Petiole scales lanceolate to ovate-lanceolate, (18.0)20.0–35.0 × 2.5–3.5 mm, tips straight to falcate, weakly twisted, lustrous, concolorous to weakly concordantly bicolorous, the dark brown to castaneous centers usually with a black base from where blackish streaks extend into the distal portions, centers either not sharply set against the brown to yellowish orange margins or transition between the centers and the margins marked by a black line. Fronds to 150–250 cm long, patent to arching, only distally weakly drooping.

Laminae to 125–150 × 90–130 cm, bipinnate-pinnatifid, firm-chartaceous, broadest at the middle, dark green adaxially, blackish when dried, dull to dark olive-green abaxially, apices gradually reduced. Pinnae to 35–45 cm long, 15–17 pairs per frond, alternate, sessile to subsessile, stalked to 0.5 cm, distally narrowly green-alate, the distal segments free to adnate, but not decurrent into the costae. Leaf axes stramineous to brown, usually darker adaxially, inermous, costules, costae and distal parts of rhachises densely hairy adaxially, hairs 0.5–1.0 mm long, whitish to

tan, antrorsely arching, abaxially glabrous to glabrescent, with a matted tomentum of orange-brown tortuous hairs and highly dissected lanceolate squamules to 1 mm long, costae 2–3 mm broad, junctions of costae and rhachises abaxially weakly swollen, each with a dark brown, inconspicuous, planar, elliptic pneumathode to 3 × 1–2 mm. Pinnules to 7.0–9.5 × 1.5–1.9(2.3) cm, alternate, articulate, long-triangular to lanceolate, basally notably cordate (Fig. 21) to truncate, tapering from the middle to acute or short-attenuate tips, the largest ones short-stalked to 2–3 mm, basally often with long persisting squamules, orange-brown to brown, segments weakly ascending, straight to distally weakly falcate, with crenulate to subentire margins and rounded to short-obtuse tips, basal segments alternately placed, often with small auricles, if remote from each other then connected by laminar tissue, sinuses 0.5–1.0(2.0) mm wide, acute to obtuse; sterile and fertile pinnules not different. Veins adaxially glabrous except for the hairy midveins to weakly hairy towards the margins, with white to tan, erect, straight to curved, multicellular hairs 0.5–1.0 mm long, the longest ones on the midveins, abaxially with many small appressed, tan to reddish brown trichomidia to 0.2 mm long, sometimes replaced by tortuous multicellular hairs 0.5–0.7 mm long, more common on the midveins than on and between the lateral veins; costules and midveins abaxially with few orange-brown to brown, flat squamules to 1.0 mm long with elongate tips and fimbriate to dissected margins, and orange-brown bullate squamules to 2 mm long with entire margins and elongate tips distally on the midveins; sterile veins forked or simple, fertile veins forked.

Sori 0.8–1.0 mm diameter, subcostal to costal, at vein forks, indusia sphaeropteroid, with umbo, tan, translucent, fragmenting to a shallow cup or disc (Fig. 21); receptacles globose, 0.2–0.4 mm diameter, paraphyses many, hyaline, tan to brown, of the same length as the sporangia (0.4–0.5 mm). Spores yellow, perispore not examined.

### Distribution and habitat

Endemic to Costa Rica and Panama, in tall cloud forests at 1200–2630 m.

### Remarks

Notably cordate bases on at least the largest pinnules characterize *Cyathea maxonii*. At first sight, the laminae appear glabrous, but usually some short hairs can be found on the veins adaxially near the margins. This and the scurf, which can persist by various degrees in the leaf axils, indicate an affinity to *C. patens* H. Karst. In both species, the laminar scurf is orange-brown and contains squamules with characteristic ciliate margins and/or ribbon-like shape. From the *C. patens* alliance, to which the sympatric *C. suprastrigosa* (H. Christ) Maxon belongs, *C. maxonii* is separated by lacking both adventitious pinnae on the petioles (present in *C. suprastrigosa* and most other species in the *C. patens* group) and arachnoid petiole scurf (present in *C. patens* and *C. suprastrigosa*). The color of the scales and the morphology of the petiole scurf squamellae of *C. maxonii* are more reminiscent of *C. squamipes* and *C. lindeniana*.

At least a part of the petiole scales in *C. maxonii* have a characteristic tinge from solid black at the scale base over a streaked center to a completely brown tip. The transition between the center and the margins is usually marked by black lines. Many petiole scales are also plain brown, especially on the adaxial side of the petioles. These brown petiole scales resemble the scales of *C. fulva* (M. Martens & Galeotii) Fée, a species which can be distinguished by its sparse, plain brown scurf on petioles. Its laminae also lack the finely dissected and ribbon-shaped squamules that are typical of *C. maxonii*. *Cyathea fulva* in a strict sense does not occur within the range of *C. maxonii*; it can be found from Mexico to Honduras (Rojas 2005), while *C. maxonii* is restricted to Costa Rica and northern Panama. Previous records of *C. fulva* from southern Central America are largely based on *C. onusta* H. Christ (Rojas 2001), which is a generally smaller species than the other two species and which can be distinguished by its whitish to tan laminar squamules (vs. brown in *C. fulva* and orange-brown in *C. maxonii*).

## 3.11 *Cyathea dissoluta*

*Cyathea dissoluta* Baker ex Jenm.: Jenman 1881: 52. – Type: Jamaica. 1879, »Jenman 1« (holotype, K-fragm. US; isotypes, NY-photo, -fragm. US, P-photo, -fragm. BM).

Selected specimens examined

Jamaica. 1853–1855, »Barkly & Barkly s. n.« (BM); St. Anne-St. Catherine, summit area of Mount Diablo, 18°12'N, 77°07'W, 900–1000 m, 30.I.2004, »Christenhusz & Tuomisto 3312« (TUR); Trelawny-St. Elizabeth, Cockpit Country, Cook's Bottom, valley E of Eldersley, 18°14'N, 77°47'W, 450–700 m, 1.II.2004, »Christenhusz & Tuomisto 3353« (TUR).

### Description

Trunks erect, to 2–3 m tall, slender, to 5–7 cm diameter, upper parts covered with glossy, dark castaneous scales, trunk apices hidden in fascicles of the youngest petioles, adventitious buds present, growing out to short geotropic, leafy branches that eventually fall off and grow into new plants (Maxon 1909). Fronds to 150–200 cm long, arching to erect. Petioles to 30 cm long, muricate to strongly spiny, brown to dark brown, without adventitious (aphlebioid) pinnae at the petiole bases, petiole scales lanceolate to ovate-lanceolate, to 12.0 × 3.0 mm, their tips straight to falcate, weakly twisted, lustrous, concordantly bicolorous, the brown to auburn centers not sharply delineated from the brown to yellowish margins, petiole scurf

absent (in material seen; possibly weakly developed and evanescent).

Laminae to 125–150 × 75–80 cm, bipinnate-pinnatifid, firmly chartaceous, broadest at the middle, dark green adaxially, blackish to dark plumbeous when dried, dull olive-green abaxially apices gradually reduced. Pinnae to 20–40 cm long, presumably 10 pairs or fewer per frond, alternate, stalked to 1–2 cm, the distal segments simply adnate. Leaf axes stramineous to brown, rhachises also castaneous, usually darker adaxially, costules, costae and distal parts of rhachises inermous, densely hairy adaxially, hairs 0.5–1.0 mm long, tan to orange-brown, antrorsely curved, costae 2–3 mm broad, junctions of costae and rhachises only weakly swollen abaxially, bearing a dark, lunulate pneumathode. Pinnules to 5.0(–8.0) × 1.5 cm, short-lanceolate, cuneate to rounded at bases, tapering from the middle to acute to short attenuate tips, alternate, the largest ones short-stalked to 3 mm, 1.0(–1.5) cm between the stalks, the segments weakly ascending, weakly falcate distally, with crenulate margins and obtuse to short acute tips, basal segments alternately placed, rarely remote from each other, sinuses 0.2–1.0(2.0) mm wide, acute to polygonal; sterile and fertile pinnules similar. Veins adaxially glabrous except for few white to tan, erect, straight to curved, multicellular hairs 0.5–1.0 mm long on the midveins, abaxially with few scattered white, curved multicellular hairs 0.5–1.2 mm long distally, with few, often ephemeral trichomidia, orange-brown to brown, 0.2–0.4 mm long; costules and midveins abaxially brown to blackish, planar to weakly raised, with orange-brown to brown, flat, ovate-lanceolate and bullate squamules to 1.0–2.0 mm long with elongate tips and fimbriate to entire margins, lateral veins flat, dark green to blackish; sterile veins forked or simple, fertile veins forked.

Sori 0.8–1.0 mm diameter, subcostal to costal, at vein forks; indusia subsphaeropteroid to sphaeropteroid, with umbo, tan, opaque, fragmenting into persisting pieces; receptacles globose, 0.3–0.4 mm diameter, paraphyses many, tufted, atropurpureus, of the same length as the sporangia (0.4–0.5 mm). Spores not examined.

### Distribution and habitat

Endemic to Jamaica, growing at 450–1500 m in humid sheltered places; substrates include wet karsted limestone.

### Remarks

*Cyathea dissoluta* is remarkable among species with sphaeropteroid indusia because it reproduces by aerial lateral shoots of the trunk (Maxon 1909). A similar strategy occurs in *C. parvula* (Jenm.) Domin, another species from the Greater Antilles. This and the overall morphological similarity suggest that the two species are related. The shape of the indusia, historically used to subdivide the tree fern alliance, has been found to differ among closely related species. A change of indusial shape from hemitelioid (as in *C. parvula*) to sphaeropteroid (as in *C. dissoluta*) can be observed in the species pair *C. holdridgeana* Nisman & L. D. Gómez (hemitelioid) and *C. moranii* Lehnert (sphaeropteroid). Tryon (1976) described *C. dissoluta* as "a rare, variable species" and suspected it to be "a hybrid, or a series of hybrids". Judging from the variation in the fine indument of the laminae, *C. dissoluta* could indeed represent a hybrid between the sympatric *C. parvula* and *C. furfuracea* Baker, but this is still speculative. The few fertile collections of *C. dissoluta* that I have examined showed no irregularities in the formation of indusia or sporangia, which are indicators of hybrids, and thus I maintain it as a species.

Morphologically, *Cyathea dissoluta* comes closest to the Central American *C. maxonii*, which shares the fine orange laminar squamellae, cordate pinnule bases, and firm, dark brown, papery indusia. However, *C. maxonii* has larger, much stouter trunks (10–12 m tall, to 10 cm diameter vs. 2–3 m tall, to 5–7 cm diameter) that lack the lateral shoots typical of *C. dissoluta*, and also has darker petiole scales than that species.

Weakly developed or absent scurf, as found in *C. dissoluta*, is a character of the *C. lechleri* group, which is further defined by having pale brown spores. The investigated specimens of *C. dissoluta* were either sterile or had shed all their spores, and the possibility remains that the absence of the petiole scurf may be an artefact. Without confirmation of these characters, *C. dissoluta* cannot be linked confidently with any recognized *Cyathea* group with sphaeropteroid indusia.

## 3.12 *Cyathea patens*
(Fig. 22)

*Cyathea patens* H. Karst.: Karsten 1869: 173, not *Cyathea patens* hort.: Houlston & Moore 1851: 164, nom. nud. – Type: Colombia. Cundinamarca, "habitat montem Bogotensem 'Guadelupe' altitudine 2900 m", »Karsten s. n.« (holotype, n. l.; isotype, B [label "Colombia"]).

### Selected specimens examined

Colombia. **Cauca**. Macizo Columbiano, Páramo Las Papas, entre El Boqueron y La Hoyola, 3200–3510 m, 7.–27.IX.1958, »Idrobo et al. 3452« (COL). **Cundinamarca**. San Bernardo, Cordillera Oriental, Quebrada Aguas Claras, arriba de La Soledad, 3100 m, 23.VII.1981, »Jaramillo Mejia et al. 6963« (COL); carretera Bogotá–Choachi, vertiente hacia Choachi, adelante de Divorsium Acuarum, 3.III.1967, »Lozano et al. 667A« (COL). **Huila/Cauca**. Macizo Columbiano, Páramo Las Papas, Cerros y alrededores de la Laguna Magdalena, 3530 m, 16.X.1958, »Idrobo et al. 3006« (COL). **Meta**. Macizo de Sumapáz, vertiente oriental de la cordillera, quebrada El Buque, 3100 m, 9.VII.1981, »Díaz-Piedrahita 2690« (COL). **Quindio**. Salento, Estación de Navarco, bosque frente a la estación, 3000 m, 24.IX.1992, »Franco et al. 3974« (COL). **Risaralda**.

Santuario, al SO del cerro Ventanas, Macizo del Tamaná, 3820 m, 11.II.1983, »Torres et al. 1892« (COL). **Santander**. Valle del Río Susa, en el camino de hato Viejo a la laguna la Friquera o Jiquera, arriba del sitio Santa Barbara, 3600 m, 30.XI.1967, »Jaramillo Mejia 4401« (COL). **Tolima**. Above Anaime on road S of Cajamarca, 4200 m, 30.VII.1972, »Barrington 474« (COL).

Venezuela. **Tachira**. Headwaters of Río Quinimarí, slopes of El Banco, below Cerro Las Copas (below Páramo Los Judios), 20 km S of San Vicente de La Revancha, 35 km S of Alquitrana, 2500–2700 m, 16.I.1972, »Steyermark et al. 100967« (NY, UC). **Trujillo**. Carache, Páramo Las Palmas, 9°42'N, 70°08'W, 2200 m, 22.V.1991, »Rivero 1242« (UC).

Ecuador. **Bolivar**. Along first 15 km of road Chillanes–El Tambo, 2400 m, 19.VII.1995, »van der Werff et al. 12434« (AAU, MO, UC). **Carchi**. Valle de Maldonado, km 53 on road Tulcán–Maldonado, 0°50'N, 78°03'W, 3150–3250 m, 17.–18.V.1973, »Holm-Nielsen et al. 5659« (AAU). **Loja**. Pass "El Tiro" between Loja and Zamora, trail from province border sign up to the cerro, 3°59'S, 79°08'W, 2750 m, 11.XI.2003, »Lehnert 1102, 1103« (AAU, GOET, LOJA, QCA, UC). **Morona-Santiago**. Road Gualaceo–Limón, 19 km E of the pass, 3°01'S, 78°37'W, 2900–2950 m, 20.XI.1990, »Navarrete & Øllgaard 3097« (QCA, MO). **Napo**. Oyacachi, ca. 2 km below the village, opposite abandoned village, 0°13'S, 78°03'W, 3150 m, 24.XII.1998, »Øllgaard & Navarrete 1229« (AAU, QCA). **Tungurahua**. Ca. 1 km S of Patate–El Triunfo road, km 14.6, 1°21'S, 78°27'W, 2850–2975 m, 24.XI.1998, »Øllgaard & Navarrete 3103« (AAU, QCA). **Zamora-Chinchipe**. Road Loja–Zamora, km 14, 4°00'S, 79°09'W, 2770 m, 19.–20.IV.1973, »Holm-Nielsen et al. 3867« (AAU).

Peru. **Amazonas**. Bagua, 2700–3000 m, 5°36'S, 78°26'W, 25.IX.1978, »Barbour 3590« (MO). **Cajamarca**. San Ignacio, 1900 m, 5°42'S, 77°53'W, II.2002, »Bonino 243« (MO). **Cuzco**. 3300 m, 13°03'S, 73°04'W, 15.X.2003, »Sucllí et al. 1330« (CUZ, MO). **Pasco**. Oxapampa, 2910 m, 10°22'S, 75°27'W, 14.II.2004, »Mellado & Monteagudo 0464« (MO, USM); Oxapampa, 3000 m, 10°22'S, 75°27'W, 15.X.2004, »Mellado & Becerra 1926« (HUT, MO, USM).

## Description

Trunks to 10 m tall, but generally smaller, with or without persistent petiole bases, to 8–14 cm diameter, often decumbent with age, pneumathodes present below frond scars, but inconspicuous, small, and of the same color as the cortex, apices hidden in fascicles of petioles, adventitious buds lacking. Fronds to 100–200(250) cm long, patent or erect, not or only weakly arching from the middle. Petioles to 35–55(110) cm long, dull brown to blackish, rarely plumbeous or yellow, aculeate to muricate, spines with scales on their tips in young petioles, with long-elliptic, gray pneumathodes on the sides basally, petiole scurf dense to diffuse, consisting of erect squamules to 0.5 mm long with white, ciliate margins (Fig. 22C), persistent, but often abraded to the indurated squamule bases. Petiole scales to 38 × 4–5 mm, long-lanceolate, persistent only on the sides of the petioles, with flat to weakly twisted apices, brown, concolorous (Fig. 22B) or weakly discordantly bicolorous (Fig. 22A), with the centers dark brown and the margins paler brown, yellowish or cream-white.

Laminae 70–140 × 70–90 cm, elliptic to narrow-ovate, bipinnate-pinnatifid, green to dark green adaxially, often becoming blackish when dried, pale gray-green abaxially, apices gradually reduced. Rhachises inermous or weakly muricate basally, with short whitish to yellowish, antrorse hairs distally, otherwise glabrous adaxially, or glabrescent with many trichomidia and squamellae on both sides, the squamellae orange-brown to brown, in glabrous forms rhachises castaneous to plumbeous-brown, in scaly forms predominantly yellowish to stramineous. Costae and costules tan, stramineous or dull brown, inermous, short-hairy adaxially, hairs to 1 mm long, multicellular, white, antrorsely curved, indument variable abaxially, ranging from a dense cover of white to tan arachnoid scurf or nearly glabrous except for white hairs and trichomidia to 0.4 mm long; bright orange-brown flattish scales with undulate fimbriate margins abundant to scarce abaxially, most frequent in axils. Pinnules to 5.0–7.5(9.7) × 0.8–1.5(1.7) cm, narrowly triangular (Figs. 22D, E), rarely linear (Fig. 22F), sessile to subsessile (stalked to 1 mm), truncate to weakly cuneate, rarely weakly cordate at base, tips acute to short-attenuate, pinnatifid to pinnatisect, basal segments rarely free and then with margins deeply crenate (Fig. 22D); segment margins serrate or sharply crenate, often still planar when dried. Veins adaxially with few to many short hairs on and sometimes between them, abaxially glabrous or glabrescent with few to many hairs restricted to the veins, hairs to 0.4 mm long, whitish to yellowish, stout and erect to thin and curved or appressed, veins with few to many small scales abaxially, ranging from broadly ovate and flat to small and bullate (Fig. 22H–J), orange-brown to brown, margins thin, paler brown to whitish, fimbriate to lacerate with long processes; sterile veins forked or simple, fertile veins forked.

Sori to 1.0 mm diameter, costal to subcostal, at vein forks (Fig. 22G); indusia sphaeropteroid, with umbo (often weakly developed), brown to yellowish, transparent, fragile, irregularly fragmenting (Fig. 22K), persistent as shallow cups or discs, receptacles globose, paraphyses of the same length as or shorter than sporangia, thin and hyaline. Spores pale yellow, perispore not examined.

## Distribution and habitat

Colombia, western Venezuela, Ecuador to central Peru, to be expected farther south. *Cyathea patens* occurs in montane forests and subparamo scrub at 2200–4200 m, which is among the highest elevations recorded for the family.

## Remarks

The typification of *Cyathea patens* is well supported by type material and the illustrations in Karsten's Florae Columbiae (1869). The earlier publication of this name by Houlston & Moore (1851) describes a cultivated species in English, but fails to deliver a comparative diagnosis and was thus considered as nomen nudum by Tryon (1976).

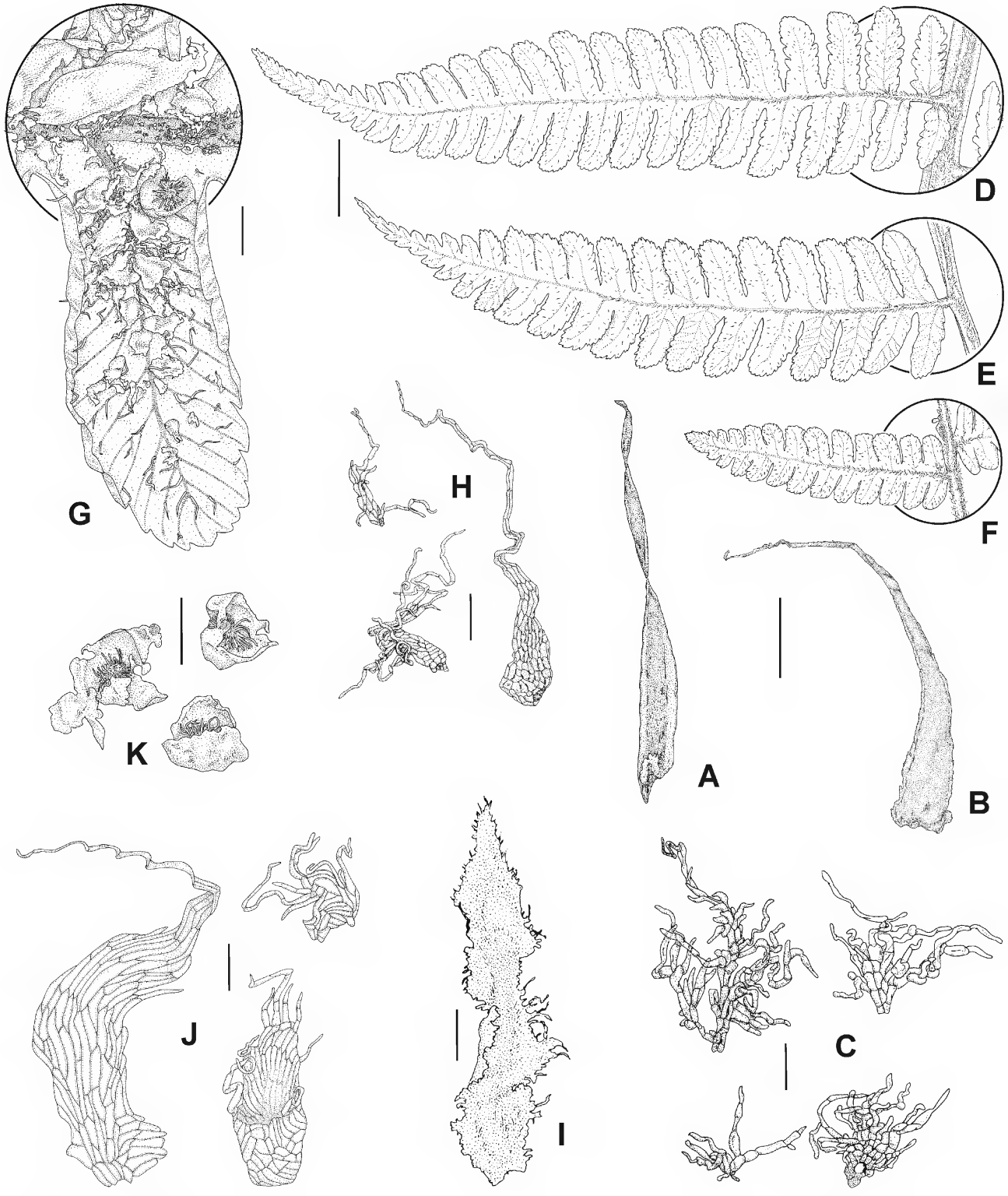


**Fig. 22.** *Cyathea patens* (A, C upper row, D, H, I from »Lehnert 950« GOET; B, E, G, K from »Lehnert 815« GOET; C lower row from »van der Werff & Palacios 10604« UC; F, J from »Lehnert 797« GOET). – **A**. Petiole scale, weakly bicolorous. **B**. Petiole scale, almost concolorous. **C**. Squamules of petiole scurf. **D**. Large pinnule, basal segments free. **E**. Large pinnule. **F**. Largest pinnule of a small frond. **G**. Fertile segment, abaxially. **H**. Laminar squamules. **I**. Small scale from costa. **J**. Laminar squamules, shortly fimbriate. **K**. Mature indusia, in different stages of fragmentation. – Scales: 1 cm (D–F, K), 5 mm (A, B), 1 mm (G, I), 0.2 mm (C, J, H).

HOULSTON & MOORE (1851) also failed to designate a type or make references to collections or illustrations. For these reasons, the name *C. patens* hort., Houlston & Moore is considered as invalid, which legitimates KARSTEN's (1869) later homonym.

*Cyathea patens* is a variable species. The indument varies with exposure to sun and wind, which in turn is correlated with elevation. In open habitats most of the orange-white, fimbriate scales, which constitute the fine indument of the crosiers, are retained especially in the axils of the rhachises and on the costae. The bullate squamules distally on the costules, which regularly have entire margins, then have fimbriate margins, too. Hairs are more abundant on the veins adaxially, but are often present and well developed on both sides. All parts of the indument are less developed if the plants grow inside the forest or at lower elevations. A nearly constant feature is the general outline of the pinnules, which is long-triangular with serrate segment margins. The variation can be observed throughout the range of the species. Very scaly forms are frequent in Ecuador, Prov. Loja/Zamora-Chinchipe.

Small plants of *C. patens* are similar to *C. bettinae* Lehnert (LEHNERT 2004) in the distribution of laminar hairs, but that species has thin trunks to 3 cm diameter (vs. to 8–14 cm in *C. patens*) and paler petiole scales (opaque white to light brown, sometimes with darker apical streak vs. concolorous brown or with paler margins).

The trunkless *C. sylvatica* Lehnert may be mistaken for precociously fertile *C. patens*, but differs in having more ovate, more concolorous petiole scales (LEHNERT 2006c).

*Cyathea suprastrigosa* (H. Christ) Maxon differs from *C. patens* by its aphleboid pinnae at the petiole bases (these are absent in *C. patens*) and the different color of the petiole scales (orange-brown to brown vs. concolorous to weakly bicolorous brown with paler margins in *C. patens*).

*Cyathea maxonii* Underw. ex Maxon is endemic to Costa Rica and Panama; previous reports from Colombia and Ecuador are based on misidentified *C. patens* and *C. fulva* agg. In both *C. patens* and *C. maxonii*, the veins are normally hairier adaxially than abaxially with the hairs relatively short (0.4–0.6 mm); indusia, laminar shape and texture, and color of scurf, petioles, and leaf axes underly the same variations. In *C. maxonii*, however, the largest pinnules are mostly subcordate to weakly auriculate at base and short-stalked to 3 mm (vs. truncate to weakly cuneate and sessile to subsessile in *C. patens*), and the scurf remnants in the axils of the leaf axes are composed of much finer dissected orange-brown squamellae.

*Cyathea squamipes* can be distinguished from *C. patens* by the more strongly bicolorous petiole scales (castaneous to blackish centers vs. brown to dark brown centers in *C. patens*), more hairs abaxially than adaxially on the veins (vice-versa in *C. patens*), and concolorous orange-brown squamellae with subentire to crested margins on the laminae (vs. mainly bicolorous with paler to whitish, crested to lacerate margins in *C. patens*).

The sympatric *C. cystolepis* Sodiro (LEHNERT in press) often grows in the same habitat as *C. patens*; both species are hairier on the veins adaxially than abaxially, and vary in the indument on the lamina abaxially from almost glabrous to densely scaly. In contrast, *C. cystolepis* has distinctly bicolorous petiole scales with brown centers and white margins (vs. concolorous brown or weakly bicolorous petiole scales in *C. patens*). »Lehnert 818« has strongly bicolorous petiole scales that match better *C. cystolepis*, but the characters of the lamina are typical of *C. patens*.

*Cyathea parvifolia* Sodiro can be distinguished by the basal aphlebioid pinnae at the petiole base, which are remote from the triangular to broadly ovate laminae; such basal pinnae are not present in *C. patens*. The petiole scales of *C. parvifolia* tend to be longer and more strongly bicolorous, often with whitish margins, although they can be simply brown as in *C. patens*. Without petiole, the discrimination of these species is difficult as both can be almost identical in laminar dissection and indument. However, the hairs in *C. parvifolia* tend to be longer (to 1.0 mm) than in *C. patens*, and its squamellae on the laminae are mostly flat, concolorous brown and not or only weakly crested marginally.

### 3.13 *Cyathea frondosa*
(Figs. 13–14, 23)

*Cyathea frondosa* H. Karst.: KARSTEN 1860: 149. – Type: Colombia. Cundinamarca, "habitat silvas humidas, umbrosas Andium Bogotensium altitudine 2700 m", »Karsten s. n.« (holotype, n. l.; isotype, B [label »Karsten 196«]).

Selected specimens examined

Colombia. **Caldas**. Manizales, Vereda La Esperanza, Reserva Torre Cuatro, 5°02'47"N, 75°22'47"W, 3000–3300 m, 26.II.2004, »Alvear-P. et al. 795« (COL). **Chocó**. Macizo del Tamaná, bajando 200 m del Valle de San Francisco, 3130 m, 16.II.1987, »Torres et al. 1957, 1963« (COL). **Cundinamarca**. La Vega, un poco mas arriba del pueblo (LaVega), 22.VIII.1980, »Acosta-Arteaga 1088« (COL). **Nariño**. Ricaurte, Reserva Natural La Planada, Cerro León, 1°09'37"N, 77°59'W, 2145 m, 29.II.1997, »Guzmán 4468« (UC). **Norte de Santander**. Cordillera Oriental, Páramo de Tamá, vertiente de Samaria, 2600–2900 m, 30.X.1945, »Cuatrecasas et al. 12728« (COL). **Valle de Cauca**. Santa Helena, above Topacio, edge of Los Farallones de Cali NP, 3°30'N, 76°35'W, 1940 m, 12.XII.1989, »Gentry et al. 53069« (UC).

Ecuador. **Carchi**. Reserva Guanderas, ca. 3 km E of Mariscal Sucre, 0°36'N, 77°41'W, 3400–3700 m, 13.XI.2002, »Navarrete & Øllgaard 3039« (AAU, QCA); El Ajún, along road N of El Playon de San Francisco, towards El Carmelo, 0°42'N, 77°36'W, 3050–3150 m, 11.VII.1994, »Øllgaard et al. 98143« (AAU, QCA); about half an hour E of Huaca, past Colonia Huaceña, 3100–3200 m, 20.II.1993, »van der Werff & Palacios

10603« (MO, AAU). **Imbabura**. Cerro Blanco, ca. 8 km (by air) WSW of Otavalo (road towards antennas from road toward San José de Minas), south of Otavalo-Selva, 0°13'N, 78°20'W, 3400–3460 m, 24.IX.1994, »Øllgaard 98214« (AAU, QCA). **Loja**. Reserva Huashapamba, 6 km S of Saraguro along Panamericana, 3°39'43.0"S, 79°16'09.9"W, 2850 m, 4.X.2007, »Lehnert 949« (GOET, QCA, UC). **Morona-Santiago**. E of pass on Gualaceo-Limon road, 3°00.27'S, 78°39.10'W, 3000–3200 m, 16.XI.2008, »Lehnert 1564« (GOET, QCA, UC). **Napo**. Oyacachi, ca. 2 km E of village, opposite Maucallacta, forest transect at Cuytoclla, 0°13'S, 78°04'W, 3100–3140 m, 7.III.2000, »Øllgaard & Navarrete 1605, 1608« (AAU, QCA). **Pichincha**. Camino Calicali–Nanegalito, 18 km from Mitad del Mundo, 0°01'N, 78°37'W, 2040–2090 m, 20.–25.IV.1995, »Ankersen & Kragelund 158« (AAU, QCA); faldas sur del Pichincha, antigua carretera a Chiriboga, 2800 m, 6.–7.VI.1987, »Mena-V. 734« (AAU, QCA). **Zamora-Chinchipe**. New road Loja–Zamora, ca. 5 km E of pass "El Tiro", above old landslide along road, 3°59'S, 79°08'W, 2500 m, 19.XI.2008, »Lehnert 1572« (GOET, QCA, UC).

P e r u . **San Martin**. Huallaga, arriba de La Ribera/La Meseta, 6°52'S, 77°28'W, 2060–2100 m, 17.VIII.1997, »Quipuscoa et al. 1085« (AAU).

## Description

Trunks to 10 m tall, to 12–16 cm diameter, without old petiole bases in large plants, variously persistent in smaller ones, then to 20 cm diameter (Fig. 14), trunk apices hidden in fascicles of petioles, sometimes with skirts of dead fronds if growing in dense understory; adventitious buds absent. Fronds to 280 cm long, weakly arching, patent in large plants, ascending in small ones. Petioles to 50–80 cm long, short-aculeate, brown to dark brown, densely covered with persistent but cleanly removable arachnoid scurf of branched hairs or narrow, ciliate squamules (Fig. 23A), the color varying from gray-white to tan (light brown), adventitious (aphlebioid) basal pinnae occurring regularly in 1–2 pairs, 15–40 cm long, reflexed, with strong costae (Fig. 13), the basal pinnules often pinnate with the basal segments remote and crenate, thus more strongly dissected than the laminae. Petiole scales narrowly lanceolate, 25–36(40) × 2–3 mm, with elongate, strongly twisted tips (3–4 times, especially when dried), brown to dark brown with somewhat paler margins, sometimes with diffuse darker areas in the centers, but never strongly bicolorous.

Laminae to 200 × 110 cm, bipinnate-pinnatifid to tripinnate, broadly ovate, deep green and lustrous adaxially, paler and matte abaxially, apices gradually reduced. Pinnae to 55 cm long, alternate, distally not or weakly greenalate, the distal segments adnate to weakly decurrent into the costae, basal pinnae not or weakly reflexed. Rhachises with scurf like on the petiole but not as dense and persistent, short-aculeate at base and in the middle, abaxially and laterally with persistent scales similar to the petiole scales, but generally paler than these, often with white margins when older (bleaching), hairs absent except for distal parts adaxially. Costae inermous to sparsely verrucate, 3–4 mm broad, costules inermous, light brown to brown, with scurf of gray-white to light brown branched hairs or long-ciliate squamules abaxially, with unbranched multicellular hairs 0.5–1.0 mm long adaxially, sometimes densely scaly with lanceolate to linear squamules (Fig. 23C) with sparsely fimbriate or short-ciliate margins. Pinnules to 10.0–12.0 × 1.8–2.5 cm, linear-oblong to long-triangular, sessile or subsessile (stalked 1 mm), bases truncate to weakly cuneate, never with auricles, tips long-acuminate to attenuate, segments weakly ascending, weakly falcate distally, with crenulate to crenate margins and obtuse tips; larger pinnules sometimes pinnate, their basal segments not remote, with crenate margins. Veins sparsely hairy to glabrous adaxially, densely to sparsely hairy abaxially, hairs 0.2–0.4 mm long, veins abaxially with some pale brown, bullate squamules (Fig. 23B) and ephemeral, whitish to tan scurf, similar to petiole scurf (Fig. 23A).

Sori 0.7–1.0 mm diameter, costal to subcostal, at vein forks; indusia sphaeropteroid, with umbo, tan to brown,

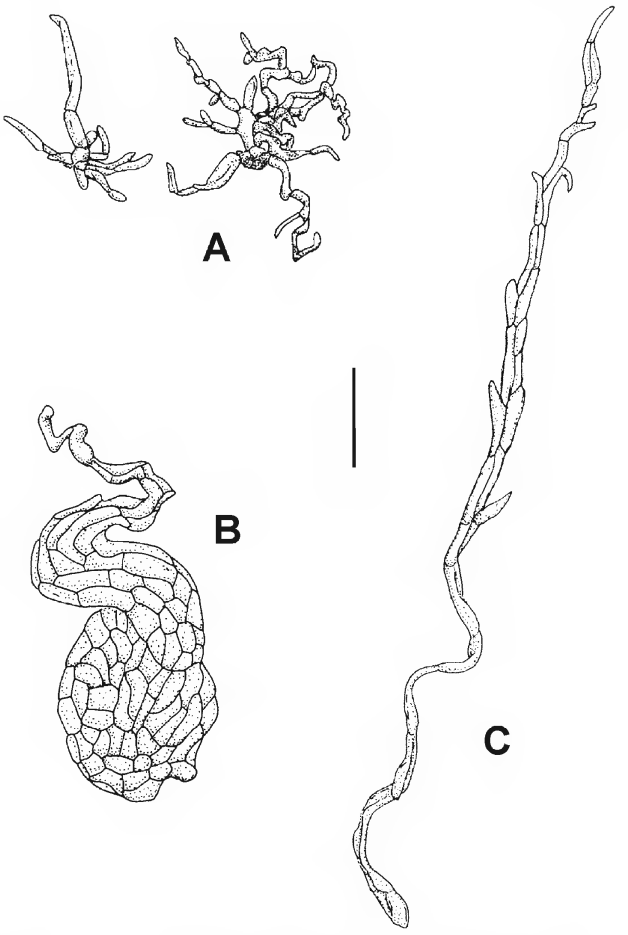


**Fig. 23.** *Cyathea frondosa* (all from »Lehnert 1572« GOET). – **A**. Squamules from petiole scurf. **B**. Bullate squamule from lamina. **C**. Ribbon-shaped squamule from costule. – Scale: 0.2 mm.

translucent, fragile, usually umbo missing, but cup-shaped part remaining, receptacles globose, 0.2–0.3 mm diameter, paraphyses few, hyaline, tan to white, of the same length as or shorter than the sporangia (0.4–0.5 mm). Spores pale yellow, perispore not examined.

Distribution and habitat

In moist montane forests at (1940)2040–3460 m in Colombia, Ecuador, and northern Peru, to be expected in western Venezuela.

Remarks

This species can be recognized by the dense, matted, whitish scurf and the aphlebioid pinnae at the petiole bases. *Cyathea brachypoda* is very similar in having adventitious pinnae and white scurf on the laminar axes, but the petiole scurf consists of browner distinct squamules and is less persistent, the largest pinnules are narrower (12–15 mm vs. 16–25 mm broad in *C. frondosa*), the indusia are less colorful and more fugacious, normally persisting only as a small disc. In both species the aphlebioid pinnae may be absent, and then they resemble *C. squamipes* H. Karst., *C. meridensis* H. Karst., or *C. aurea* H. Karst. These species, however, have darker petiole scurf consisting of distinct squamellae, and either broader or white-margined petiole scales.

*Cyathea frondosa* and *C. brachypoda* might represent only one variable species, but so far the distinguishing characters between them, which may appear feeble, seem to be constant.

*Cyathea catacampta* Alston is identical to *C. frondosa* in size and laminar dissection. Both species often have persistent crosier scales on the rhachises. The differences in the petiole scurf (whitish, arachnoid squamules in *C. frondosa* vs. orange-brown to dark reddish brown, erect lanceolate squamules in *C. catacampta*) and petiole scales (concolorous brown to weakly bicolorous with whitish margins vs. strongly bicolorous blackish with orange margins) separate both species well. *Cyathea catacampta* also lacks adventitious pinnae.

*Cyathea suprastrigosa* (H. Christ) Maxon from Costa Rica and Panama, another species with adventitious basal pinnae, is distinguished from *C. frondosa* by its broader petiole scales, stronger laminar pubescence, and more bicolorous laminar squamules. The auricles at the base of the sessile pinnules that are characteristic of *C. suprastrigosa* are absent in *C. frondosa*.

### 3.14 *Cyathea brachypoda*

*Cyathea brachypoda* Sodiro: Sodiro 1908: 8. – Type: Ecuador. Pichincha, "Sylv. suband. vulc. Atacatzo", »Sodiro s. n.« (lectotype, Q, designated by Lehnert 2008; isolectotypes, SI [nº 22795, 22707], US).

*Cyathea asperata* Sodiro: Sodiro 1908: 9. – Type: Ecuador. Pichincha, "In silvis suband. m. Pichincha, III.1903", »Sodiro s. n.« (lectotype, SI [nº 22801], designated by Lehnert 2008; isolectotypes, NY, US).

*Cyathea asperata* var. *brevipes* Sodiro: Sodiro 1908: 10, ex descr. No specimen cited.

*Cyathea muricatula* Sodiro: Sodiro 1908: 10. – Type: Ecuador. Pichincha, "In silvis suband. vulc. Corazón, XII.1907", »Sodiro s. n.« (holotype, n. l.; isotypes, NY, P, US).

Selected specimens examined

E c u a d o r . **Napo**. Valley of Río Oyacachi, 10 km W of El Chaco, ridge SE of Río San Juán Grande, 0°17'S, 77°52'W, 1950–2020 m, 13.–14.III.1996, »Øllgaard & Navarrete 1690« (AAU, QCA); Baeza, 12 ha de bosque poco disturbado y disturbado, 2 km antes de Baeza (carretera Papallacta–Baeza, parte alta de "Y"), 0°28'S, 77°54'W, 2000 m, 19.–20.III.1993, »Valencia et al. 2896, 2897, 2911, 2914, 2917« (AAU, QCA). **Pichincha**. Lloa valley, one-hectare plot, Hacienda Las Palmeras del Lcdo. Fernando Sotomayor, 14 km below Lloa towards Mindo, 0°50'N, 78°38'W, 2900 m, 13.–14.X.1990, »Jørgensen & Yepez 92576« (AAU, QCA); Reserva Maquipucuna, ca. 5 km (airline) ESE of Nanegal, Hacienda El Carmen, trail along Río Umachca, just W of research station, 0°07'N, 78°38'W, 1250–1350 m, 28.II.–4.III.1995, »Øllgaard et al. 904« (AAU, QCA).

Description

Trunks to 4(–5) m tall, to 8–12 cm diameter, without old petiole bases. Petioles with sparse scurf of pale brown, round squamellae with crested margins, usually with basal adventitious (aphlebioid) pinnae. Petiole scales dark brown, sometimes blackish, concolorous or weakly concordantly bicolorous with paler brown, rarely whitish margins. Laminar indument with small flattish to weakly bullate, whitish to brown squamules abaxially; veins glabrous or midveins adaxially with 1–3 hairs, shortly pubescent abaxially, with atrorsely curved hairs 0.2 mm long or less, sometimes replaced by appressed white trichomidia, rarely almost glabrous, hairs absent between veins or only few below the sinuses abaxially. Indusia sphaeropteroid, membranaceous, spores yellow.

For full description see Lehnert (2008).

Distribution and habitat

Restricted to northern Ecuador, to be expected in southern Colombia. Upper montane forests at 1200–2300(2900) m, preferentially along creeks in semi-shade.

Remarks

*Cyathea brachypoda* may be confused with other species having aphlebioid pinnae on the petiole bases, but differs among these from *C. suprastrigosa* and *C. frondosa* in the petiole scurf (rather sparse and brown in *C. brachypoda* vs. dense, whitish to gray in the other two species) and from *C. parvifolia* in the laminar indument (more hairs abaxially than adaxially in *C. brachypoda* vs. more hairs adaxially than abaxially in *C. parvifolia*) and the larger fronds (to 320 cm long vs. to 150 cm long). The

petiole scales of *C. brachypoda* are generally darker than in *C. parvifolia* but there is a certain overlap in the variation of this character.

### 3.15 *Cyathea parvifolia*
(Figs. 15, 24)

*Cyathea parvifolia* Sodiro: Sodiro 1908: 7. – Type: Ecuador. Pichincha, "in silvis subandinis occidentalibus montis Pichinchae", III.1901, »Sodiro s. n.« (holotype, n. l.; isotypes, A, n. v., K, P, UC, US).

*Cyathea brevistipes* R. C. Moran: Moran 1991: 94. – Type: Ecuador. Loja, Parque Nacional Podocarpus, along road from Yanaga to radio towers on Cerro Toledo, 2900–3200 m, 29.IV.1987, »van der Werff & Palacios 9185« (holotype, MO; isotype, UC).

Selected specimens examined

Colombia. **Putumayo**. Nariño, on road from Pasto to Mocoa, 9.VIII.1972, »Barrington 520« (GH).

Ecuador. **Azuay**. Road Gima–Gualaquiza (under construction), km 17.4, 3°16'S, 78°56'W, 3300 m, 28.XII.1994, »Øllgaard et al. 98608« (AAU, QCA). **Carchi**. Montufar, 0°35.5'N, 77°42'W, 3400 m, 26.VI.1994, »Fay & Fay 4295« (MO, QCNE). **Loja**. Cerro Toledo, E of Yangana, between Loja and Valladolid, 4°23'S, 79°07'W, 3000–3100 m, 27.X.2008, »Lehnert 1450« (GOET, QCA, UC); Cordillera del Loro, 50 km N of Loja, just before descending towards Saraguro, along road to radar station, 3000–3200 m, 9.V.1991, »van der Werff & Palacios 9429« (AAU, QCA). **Pichincha**. Cayambe, 0°07'N, 77°57'W, 3420 m, 27.XII. 1999, »Cuamacás & Gudiño 456« (MO, QCNE).

Peru. **Pasco**. Prov. Oxapampa, Dist. Huancabamba, Lanturachi, sector Santa Barbara, road to Milpo, 10°22'S, 75°36'W, 2824 m, 10.X.2003, »Perea et al. 721« (MO).

Bolivia. **La Paz**. Prov. Franz Tamayo, Madidi, Kalla-Tokuaque, Ichocorpa, 14°39'44"S, 68°57'54"W, 3476 m, 25.VI.2005, »Fuentes et al. 8689« (GOET, LPB).

#### Description

Trunks to 5–6 m tall, but generally smaller, fertile when still trunkless, with persistent petiole bases (Fig. 15), rotting to a fibrous mass, to 10–15(30) cm diameter, often decumbent with age, inconspicuous lenticels present below frond scars, small and in color of cortex, apices hidden in fascicles of petioles; adventitious buds lacking. Fronds to 55–150 cm long, patent, only weakly arching. Petioles to 5–35 cm long, dull brown when dried, yellowish green to greenish brown when fresh, inermous to muricate, basally often with 1–2 pairs of small adventitious pinnae (Fig. 15) of the same dissection as the main laminae, long-elliptic gray pneumathodes present on the sides of petioles and proximal rhachises; petiole scurf inconspicuous, consisting of persistent, appressed squamules to 0.5 mm long (Fig. 24A), translucent, tan to brown with opaque white marginal processes, visible as appressed hairs and trichomidia, often abraded, scurf also with few white, dissected squamules and sometimes some erect brown lanceolate squamules between the petiole scales. Petiole scales to 15.0–28.0 × 2.5–4.0 mm, narrowly to broadly lanceolate, the tips straight to falcate, weakly to strongly twisted, brown to dark brown (Fig. 15), rarely auburn to orange-brown (shade plants), concolorous or weakly discordantly bicolorous, with the centers dark brown and the margins paler, sometimes appearing yellowish or cream-white.

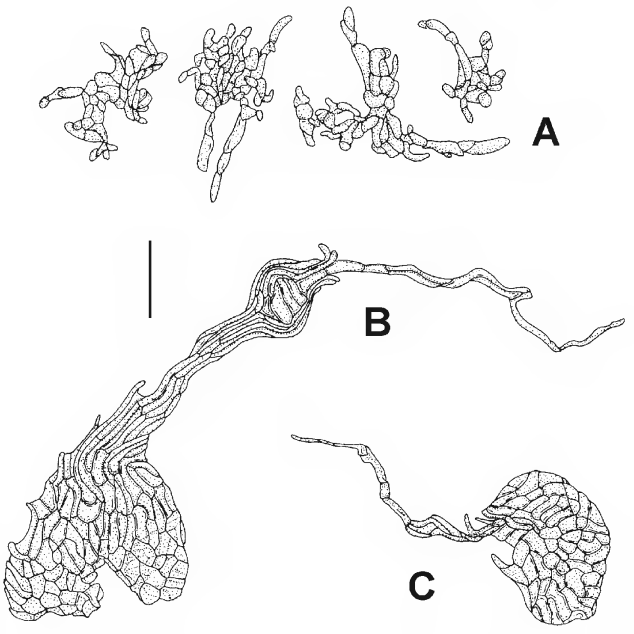


**Fig. 24.** *Cyathea parvifolia* (all from »Lehnert 1450« GOET). – **A**. Squamules from petiole scurf. **B**. Squamule from costa. **C**. Bullate squamule from lamina. – Scale: 0.2 mm.

Laminae to 70–100 × 30–70 cm, broadly ovate to triangular, bipinnate-pinnatifid, apices gradually reduced, basally truncate to cuneate, green to dark green adaxially, often turning blackish when dried, pale green abaxially. Pinnae to 20–35 cm long, sessile, distally narrowly greenalate. Leaf axes inermous to sparsely verrucate; rhachises adaxially sometimes with larger, spreading scales along the sides, densely hairy adaxially with whitish to yellowish, antrorsely curved hairs 1–2 mm long, longer ones twisted, indument abaxially varying from almost glabrous except for scattered white hairs and trichomidia to 0.4 mm long to a dense cover of white to tan scurf, also with bright orange-brown, flattish scales with undulate-fimbriate margins (Fig. 24B), most frequent in axils; costae and costules tan, stramineous or dull brown, junctions of costae and rhachises not swollen, each with a circular, planar to protruding pneumathode of 1.0–1.5 mm diameter, with a basally adjoining, glabrous, flat area, which may blacken and depress when dried. Pinnules narrowly triangular to lanceolate, rarely in small forms oblong, largest ones 3.5–6.5 × 0.8–1.5(1.8) cm, sessile to subsessile (stalked to

2 mm), bases truncate to weakly cuneate, rarely weakly cordate, tips acute to short-attenuate, basal segments rarely free and then with margins strongly crenate, sinuses to 1.0–2.0 mm wide, acute to obtuse or rectangular, segment margins serrate or sharply crenate, often still planar when dried; sterile and fertile pinnules not different. Veins adaxially with few to many multicellular hairs on and sometimes between the veins near the margins, also with tortuous, white hairs, these caducous and often completely absent in older fronds, abaxially without hairs, mainly with few to many, bullate, auburn to brown squamules to 1.0 mm long (Fig. 24C) with long, whitish tips, midveins also with flat lanceolate scales to 2–3 mm long with thin, paler brown to whitish margins; sterile veins forked or simple, fertile veins forked.

Sori costal to subcostal, at vein forks; indusia sphaeropteroid, with umbo, brown to yellowish, slightly transparent, fragile, fragmenting irregularly, a shallow cup or disc remaining, receptacles globose, 0.3–0.4 mm diameter, paraphyses thin and hyaline, shorter than sporangia (0.2–0.3 mm). Spores pale yellow, perispore not examined.

### Distribution and habitat

In elfin forests and scrub, close to and above the tree line at (2800)3000–3500 m from southern Colombia to central Bolivia.

### Remarks

*Cyathea parvifolia* occurs very locally but usually in sizeable populations. This name has been treated as a synonym of *Cyathea caracasana* var. *meridensis* (H. Karst.) R. M. Tryon (= *Cyathea meridensis* H. Karst.; Tryon 1976). The true *C. parvifolia* was recognized as distinct and newly described as *Cyathea brevistipes* by Moran (1991). Moran's error is understandable since *C. parvifolia* resembles the real *C. meridensis* only superficially in the pinnule shape. The latter species has petiole scales with almost black centers and dark castaneous, easily abraded scurf consisting of small, strongly fimbriate squamules on petioles and leaf axes. In contrast, *C. parvifolia* has dull brown to orange-brown petiole scales and scurf that consists of translucent pale brown squamules with short-ciliate margins, which are usually plastered tightly to the petiole's cortex and are detectible only if actively scraped off.

Adventitious pinnae at the petiole bases are rare in the genus *Cyathea* and were previously known only from *C. suprastrigosa* H. Christ, with which *C. parvifolia* had been compared (as *C. brevistipes*; Moran 1991). Other Neotropical species of *Cyathea* with adventitious pinnae are *C. frondosa* H. Karst., *C. brachypoda* Sodiro, and *C. pallescens* Sodiro (Lehnert 2008). In most of these species, the adventitious pinnae may sometimes be missing. A characteristic variation of this character was observed in two populations from paratype localities of *C. brevistipes* in Ecuador and Bolivia. Generally, the gap between the aphlebioid pinnae and the subsequent pinna pairs diminishes with increasing size of the trunk. The characteristic basal pinnae are generally present but may be missing in some plants of a population. Trunkless plants growing in the shade have usually triangular blades and rather long petioles that lack adventitious pinnae; despite their small size they are usually fertile. Bolivian plants have pinnules generally twice the size of most Ecuadorian plants, and have also more colorful orange-brown scales. This is probably a response to the more sheltered conditions in which they grow. Most collections from Ecuador come from wind-swept paramos, while the known Bolivian populations grow in low elfin forests.

## 3.16 *Cyathea herzogii*

*Cyathea herzogii* Rosenst.: Rosenstock 1913: 7. – Type: Bolivia. Santa Cruz, Yungas de San Mateo, [ca. 17°53'S, ca. 64°30'W,] 2400 m, IV.1911, »Herzog 1990« (holotype, L-photo GH; isotypes, S, NY, UC, US, Z).

### Selected specimens examined

Peru. **Cuzco**. Prov. Paucartambo, Manu National Park, 2750 m, VI.2003, »García et al. 147« (CUZ, USM); Prov. La Convención, Dist. Santa Ana, Tunquimayo, 12°54'37"S, 72°50'13"W, 2675 m, 22.IX.2004, »Calatayud et al. 2820« (MO); La Convención, ca. halfway between Camp 4 & Camp 5, 12°37'S, 73°32'W, 2600–2750 m, 4.VII.1968, »Dudley 10792« (GH). **Junín**. Prov. Satipo, northern Cordillera Vilcabamba, eastern slope, upper Río Puyeni watershed, 11°33'35"S, 73°38'W, 2090 m, 26.VI.1997, »Boyle et al. 4749« (USM). **Pasco**. Prov. Oxapampa, Dist. Huancabamba, sector quebrada Yanachaga (P. N. Yanachaga-Chemillén), 10°23'31"S, 75°28'30"W, 2400–2500 m, 12.II.2004, »Mellado 286« (MO); Dist. Oxapampa, Abra Villa Rica, 10°40'36"S, 75°18'55"W, 2400 m, 28.VIII.2004, »Mellado 1652« (MO).

Bolivia. **Cochabamba**. Prov. Carrasco, a ca. 3 km desde el campamento Locotal, en dirección NO, a lo largo de la antigua senda de Kara Huasi a Pojo, 17°46'12"S, 64°45'62"W, 2200 m, 2.II.2000, »Jiménez 305« (GOET, LPB, UC). **La Paz**. Prov. Nor Yungas, Estación Biológica de Tunquini, senda nueva del camino de la mina (curva al lado oeste) al pantanón, 16°12'S, 67°53'W, 2800 m, 13.IX.2000, »Bach et al. 1019« (GOET, LPB, UC); Prov. Sur Yungas, 9 km de Huancané en la carretera hacia San Isidro, 16°21'S, 67°31'W, 2400 m, 2.V.1989, »Smith D. N. & Smith J. F. 13101« (AAU, LPB, MO, NY).

### Description

Trunks to 4 m tall, to 10–15(20) cm diameter, with persistent petiole bases in small plants, balding when older and larger. Petioles to 25–60 cm long, brown to stramineous, aculeate to verrucate, with inconspicuous brown scurf of appressed lacerate squamules, and sometimes with small appressed hairs. Petiole scales lanceolate to broadly lanceolate, (7)20–26(36) × (1.6)3–5(8.2) mm, concolorous brown or concordantly bicolorous with margins tan or rarely whitish.

Laminae to 80–160 × 60–110 cm. Rhachises with dense pubescence of whitish to tan multicellular hairs to 1.2 mm long. Pinnae sessile to short-stalked to 4 mm, acuminate, distally green-alate, the wings at least slightly arcuate. Pinnules to 50–75(90) × 10–15(17) mm, truncate to round basally, sessile to subsessile (stalked to 1 mm), linear-oblong to linear-obovate, acuminate apically; white multicellular hairs (0.4–0.6 mm) on and between the veins abaxially and adaxially, abundant and equally distributed on both sides to nearly glabrous with more multicellular hairs adaxially than abaxially (here substituted by short appressed trichomidia); few to many bullate squamules, 0.6–1.0 mm long, shiny auburn to orange-brown, rarely paler to whitish, on costules and larger veins abaxially.

Sori costal, indusia sphaeropteroid, with apical umbo.

For full description see Lehnert (2006b).

#### Distribution and habitat

Bolivia and Peru, growing in elfin forests and upper montane forests at 2000–3000 m.

#### Remarks

This species is characterized by the relatively short, linear to weakly oblanceolate pinnules with acute or only weakly attenuate tips. It was included in *Cyathea caracasana* var. *boliviensis* (Rosenst.) R. M. Tryon, but most specimens were erroneously identified as *C. delgadii*. Like *C. delgadii* and *C. squamipes*, *C. herzogii* has small auburn to orange-brown squamules abaxially on veins and costules, but differs in having hairs between the veins abaxially and adaxially. *Cyathea delgadii* is equally hairy on both surfaces of the veins, but not or only weakly hairy between the veins adaxially, with hairs notably longer (1 mm vs. 0.4–0.6 mm in *C. herzogii*); *Cyathea squamipes* generally has no hairs between the veins except for occasional few short hairs below the sinuses abaxially. The spore morphology supports the separation of *C. herzogii* from these two species because the exospore of *C. herzogii* is not verrucate but smooth, and resemble those of *C. austropallescens* Lehnert (Lehnert 2006b, 2008).

### 3.17 Dubious and excluded species

#### *Cyathea boconensis*

*Cyathea boconensis* H. Karst.: Karsten 1856: 458. – Type (cited in Karsten 1869: 171): Venezuela. Mérida, "Habitat ad pedem australis montis glacialis Meridensis altitudine 1000 m", »Karsten s. n.« (holotype, n. l.).

Listed as a synonym of *Cyathea caracasana* var. *boliviensis* by Tryon (1976). During my studies, I have not seen any material I could relate to the diagnosis, although the name has been applied to some specimens. Without any material at hand, this species is impossible to define. The depicted laminar indument (Karsten 1869), with bullate squamules on small pedicels and with caudate apices as well as the narrow, ribbon-like scales resembles that of *C. patens*. However, the described pneumathodes at the costa bases, the medial position of the sori, and the distribution of hairs of *C. boconensis* are quite different.

#### *Cyathea chimborazensis*

*Cyathea chimborazensis* (Hook.) Hieron.: Hieronymus 1906: 230. – *Alsophila chimborazensis* Hook.: Hooker 1866: 37. – *Cyathea caracasana* (Klotzsch) Domin var. *chimborazensis* (Hook.) R. M. Tryon: Tryon 1976: 81. – Type: Ecuador. Chimborazo, "Chimborazo, Ecuador", 914–1219 m, Spruce 5743 (holotype, K-fragm. B; isotypes, BM, P, US [fragm.]).

Treated as a variety of *Cyathea caracasana* by Tryon (1976), but the type material represents a species of uncertain status from a different group (Lehnert 2008). The laminar indument in the type material of *C. chimborazensis* varies in amount but generally agrees well morphologically with that of *C. cystolepis* Sodiro (Lehnert 2008). The pinnules, however, are much broader and more widely placed along the costae than in *C. cystolepis*.

#### *Cyathea fulva*

*Cyathea fulva* Sodiro: Sodiro 1883: 13, not Fée 1857: 34. – Lectotype (chosen by Tryon 1976): Ecuador. Riobamba, Tambo-Ioma [= Tamboloma], X.1882, »Sodiro s. n.« (lectotype, P-photo GH; isolectotypes, B?-fragm. NY, K-fragm. NY).

*Cyathea sodiroi* C. Chr.: Christensen 1905: 195, nom. nov. for *Cyathea fulva* Sodiro, not (M. Martens & Gal.) Fée.

= *Cyathea tungurahuae* Sodiro (Lehnert 2008).

Listed as a synonym of *Cyathea caracasana* var. *caracasana* by Tryon (1976), but the type material represents *C. tungurahuae* Sodiro.

#### *Cyathea membranulosa*

*Cyathea membranulosa* H. Christ: Christ 1907: 271. – Syntypes: Costa Rica. San Pascon, 1500 m, »Wercklé s. n.« (P [Herb. Inst. Nat. Costaric. 17024]); La Palma, 1500 m, »Wercklé s. n.« (P [Herb. Inst. Nat. Costaric. 17082], n. v.).

Listed as a synonym of *Cyathea caracasana* var. *maxonii* by Tryon (1976). The name has priority over *C. maxonii* but I have not seen the type material at P. Discrepancies in the descriptions, e. g., the type of indusia (membranaceous, fugacious in *C. membranulosa* [Christ 1907] vs. rather firm and persistent in *C. maxonii*) allow the possibility that both names represent different species.

### *Cyathea mettenii*

*Cyathea mettenii* H. Karst.: Karsten 1860: 113. – Type: Colombia. Cundinamarca, "habitat silvas humidas umbrosas Andium Bogotensium altitudine 2700 m", »Karsten s. n.« (holotype, n. l.; isotypes, B [label "Bogotá, 9000 ft., Karsten 195"], US [label "Bogotá, Karsten 195"]).

*Cyathea mettenii* var. *caucana* Hieron.: Hieronymus 1905: 437. – Type: Colombia. Cauca, über Palatará, 3000 m, 5.II.1884, »Lehmann 3482« (holotype, B, n. v.; isotypes, K, US).

Two specimens at B cited as isotypes by Tryon (1976) agree well with the description of *C. patens* but do not match the description of the paraphyses of *C. mettenii* given by Karsten (1860). These are described and illustrated in the Flora Columbiae as being longer than the sporangia. The Berlin specimens have much shorter paraphyses and comply in this regard with the circumscription given here. In my experience, it is unlikely that the paraphyses would have these larger proportions because sphaeropteroid indusia, as occurring in *C. patens*, are molded around the sporangia and leave limited space for the paraphyses. The illustration of the paraphyses of *C. mettenii* must be based either on a misinterpretation of the material or on a confusion of species. Another difference is the scale color, which was stated by Karsten as brown; in *C. patens*, it is mostly weakly bicolorous (Karsten 1860) and rarely almost concolorous. Otherwise the descriptions and illustrations are matching, especially the habit of the plant and the distribution of scales.

### 3.18 Partial key to *Cyathea*

Preliminary key to the genus *Cyathea* with bipinnate-pinnatifid or more complex laminae from the Neotropics. Species that have been treated as synonymous by Tryon (1976) with *C. caracasana* are spaced.

**1** Sori exindusiate, sometimes with one or few small scales attached to the receptacles, scales with narrow insertions, entire margins, and acute tips, easily detached and not present in all sori. . . . . **2**

– Sori indusiate, indusia sometimes fragmented and missing except for lacerate rings around the receptacle bases (remove receptacles for secure identification), indusial fragments sometimes scale-like but with broad insertions and with irregularly formed margins and apices. . . . . **3**

**2** Petioles with adventitious pinnae near their bases. . . . . ***C. pallescens***

– Petioles without adventitious pinnae. . . . . Various species (see Lellinger 1984, 1987 and references therein)

**3** Indusia hemitelioid to cyatheoid, not or only weakly fragmenting with maturity of the sporangia, fragments remaining attached to receptacles, mode of damage to the indusia homogenic in most sori. . . . . Various species (see Tryon 1976, Lellinger 1984 and references therein)

– Indusia sphaeropteroid to subsphaeropteroid, sometimes very fragile and fugacious with maturity of the sporangia, mode of damage to the indusia heterogenic. . . . . **4**

**4** Petiole scurf mostly lacking in mature fronds, either weakly developed or ephemeral, consisting of a matted tomentum of branched hairs and small squamules, appearing amorphous; petiole scales almost concolorous dark brown to castaneous to strongly bicolorous with bright orange margins (in latter case sometimes together with almost concolorous orange scales); petioles usually inermous, never with adventitious pinnae; mature spores pale brown. . . . . ***C. lechleri*** (Mett.) Domin group, ***C. dissoluta***

– Petiole scurf well developed, components visible as clearly separated squamules or as matted tomentum, but not appearing amorphous – if weakly developed to ephemeral then not matted but with distinct squamules, and then also petiole scales either concolorous orange-brown or with distinct white margins; petioles often strongly aculeate, sometimes with adventitious pinnae; mature spores pale to dark yellow. . . . . **5**

**5** Petiole scurf a dense matted tomentum of grayish to white, branched tortuous hairs and strongly dissected squamules, only removable in clusters or larger flakes. . . . . **6**

– Petiole scurf not matted, removable as single squamules, branched tortuous hairs absent (although long, tortuous marginal cilia may be present on squamules); if squamules dissected then dark brown to castaneous. . . . . **8**

**6** Petioles inermous, without adventitious pinnae; petiole scales ovate to broadly lanceolate, bicolorous dark brown with broad grayish margins. . . . . ***C. moranii***

– Petioles weakly to strongly aculeate, regularly with 1–2 pairs of adventitious pinnae; petiole scales with elongate, strongly twisted tips (3–4 times, especially when dried), concolorous to bicolorous dark brown with narrow paler brown margins. . . . . **7**

**7** Pinnules (at least in part) with auriculate bases; petiole scales 2.0–6.5 mm broad, concolorous to weakly concordantly bicolorous, auburn to dark brown, with slightly paler margins; laminae adaxially with white to tan, erect multicellular hairs to 1 mm long on the midveins, hairs abundant to sparse on the lateral veins 0.6 mm long, laminae abaxially with hairs 0.5–1.0 mm long to various degrees on costules, midveins, and lateral veins, rarely between the veins. – Central America. . . . . ***C. suprastrigosa***

– Pinnules with cuneate to truncate bases, never auriculate; petiole scales 2–3 mm broad, brown to dark brown with somewhat paler margins, sometimes with diffuse darker areas in the centers, but never strongly bicolorous; laminae adaxially sparsely hairy on midveins and practically no hairs on the lateral veins, variously developed abaxially, hairs only 0.2–0.4 mm long. – Andes. . . . . ***C. frondosa***

**8** Petiole scurf brown, orange-brown, atropurpureous, or castaneous, never white or bicolorous with whitish margins, either pulverulent or consisting of erect squamules of various sizes, never with long marginal cilia or short darkened cilia/teeth; petiole scales concolorous brown to dark brown, orange-brown or castaneous – if bicolorous then margins pale brown, orange-brown or yellowish, never pure white. **9**

– Petiole scurf pale brown, tan, stramineous, cream, ivory, or white, consisting of distinct erect, round to lanceolate squamules, sometimes with short darkened teeth – if squamules bicolorous then with long, often contorted, fragile whitish cilia and with pale brown (to brown) centers appressed to the petiole; petiole scales concolorous white or bicolorous with tan to white (never orange-brown) margins. . . . . **30**

**9** Petiole scurf pulverulent, consisting of fine, oblong to narrowly lanceolate squamules rarely more than 0.5 mm long, either dissected or with fimbriate margins, dark brown to castaneous; laminae glabrous to sparsely hairy with multicellular hairs less than 1 mm long. . . . . **10**

– Petiole scurf consisting of erect squamules of various sizes, usually cristate, brown to dark orange-brown or atropur-

pureous; laminae glabrous to densely hairy with multicellular hairs to 2 mm long. . . . . **16**

**10** Petiole scales very scarce and fugacious; laminae firm-herbaceous, the segment margins inciso-serrate and flat; lateral buds, stolons, or aerial roots in upper trunk parts common. . . . . (*C. xenoxyla* group) **11**

– Petiole scales abundant and persistent at least in lower parts; laminae firm-chartaceous to coriaceous, the segment margins entire to mostly shallowly (rarely strongly) crenate and then margins weakly convolute; stolons lacking, lateral buds only forming after injury of the apex, aerial roots restricted to lower trunk parts. . . . . (*C. caracasana* group) **12**

**11** Trunks to 5 cm diameter, forming clonal groups with basal lateral shoots; laminae spade-shaped, with truncate bases; strongly raised, pad-like pneumathodes at the junctions of rhachises and costae presumably secretive, functioning as nectaries. . . . . ***C. planadae*** N. C. Arens & A. R. Sm.

– Trunks to 8–10 cm diameter, usually single but small adventious buds and roots occur all along the trunks; laminae ovate-elliptic, with round bases; pneumathodes at the junctions of rhachises and costae without secretive function. . . . . ***C. xenoxyla*** Lehnert

**12** Indusia very thin, hyaline to white, sometimes a mucous layer in fresh material, evanescent when dried; petioles yellowish, stramineous to plumbeous, near the bases sometimes darker brown, usually strongly muricate to aculeate; laminar indument with pale brown to whitish, sometimes contrastingly bicolorous, lanceolate squamules; junctions of costae and rhachises swollen only abaxially. . . . . **13**

– Indusia rather firm, tan to brown, fragmenting at maturity to irregular cups or discs; petioles inermous, smooth or sparsely verrucate (exceptionally with few strong spines near the very base), usually dark brown to castaneous, not constrasting with the castaneous scurf; laminar indument with yellowish to dark brown, never contrastingly bicolorous squamules; insertions between costae and rhachises circularly swollen abaxially and adaxially. . . . . **14**

**13** Pinnae in 8–10 pairs, stalked to 2–3 cm; costules abaxially not hairy, or if single short hairs present abaxially then also with short hairs below the sinuses and scattered on lateral veins; laminar indument lacking bicolorous squamules; segment margins of larger pinnules subentire to shallowly (but never deeply) crenate. . . . . ***C. caracasana***

– Pinnae in 12–15 pairs, stalked to 0.5 cm; costules abaxially sparsely to moderately hairy with short white erect multicellular hairs to 0.5 mm long; laminar indument including whitish, broadly lanceolate squamules with dark brown marginal teeth and basal spots; segment margins of larger pinnules shallowly to deeply crenate. . . . . ***C. crenata***

**14** Largest pinnules less than 2 cm broad, all sessile to subsessile (exceptionally short-stalked to 3 mm), usually held upright with respect to the costae; trunks shedding old petiole bases and reaching diameter of 12–16 cm when less than 2 m tall; scales on lower parts of petioles narrowly lanceolate, to 5 cm long. . . . . ***C. plicata***

– Largest pinnules more than 2 cm broad and notably stalked, all held in one plane with the costae; if pinnules smaller and sessile then the whole plants diminuitive with trunks less than 2 m tall and to 5–12 cm diameter including the persistent old petiole bases. . . . . **15**

**15** Larger squamellae of petiole scurf oblong to oblanceolate, squamellar margins appearing paler in backlight; laminar indument brown to yellowish brown, paler than the petiole scurf; trunks with persistent petiole bases at least when smaller than 2 m, reaching 5–12 cm diameter; sizes and proportions of plants variable but habit always gracile. . . . . ***C. meridensis***

– Larger squamellae of petiole scurf asymmetrically lanceolate, squamellar margins not appearing paler in backlight; laminar indument dark brown to castaneous, of same color as the petiole scurf; trunks shedding petioles when smaller than 2 m, reaching 15–20 cm diameter; stout, massive plants. . . . . ***C. carolihenrici***

**16** Fertile plants diminuitive, trunkless; petioles inermous; laminae less than 50 cm long, shallowly but fully bipinnate-pinnatifid. . . . . ***C. sylvatica***

– Fertile plants with trunks; petioles muricate to aculeate; laminae more than 50 cm long, if shorter then pinnate-pinnatifid to bipinnate (precociously fertile juveniles). . . . . **17**

**17** Petioles usually with aphlebioid pinnae; laminar indument with whitish to pale brown, dissected squamules and pale brown to brown, bullate squamules with entire margins and attenuate tips. . . . . ***C. brachypoda***

– Petioles without aphlebioid pinnae; laminar indument with orange-brown to brown, flat ovate-lanceolate and bullate squamules to 1.0–2.0 mm long with elongate tips and fimbriate to entire margins. . . . . **18**

**18** Fronds with 10 pinna pairs or fewer; trunks small and decumbent, to 3 m tall and 7 cm in diameter, with lateral aerial shoots. – Jamaica. . . . . ***C. dissoluta***

– Fronds with 12–15 pinna pairs, rarely fewer; trunks stout and erect, to 12 m tall and 10 cm in diameter, without lateral shoots (branching may occur after injury of apex). . . . . **19**

**19** Petiole scales concolorous or nearly so, rather dull brown to lustrous orange-brown with somewhat paler margins; scurf either scarce or ephemeral, missing in fully expanded fronds, sometimes scurf replaced by dense pubescence of muticellular hairs to 2 mm long. . . . . **20**

– Petiole scales bicolorous with dark brown to blackish centers at least in basal petiole parts, if concolorous then dark brown to atropurpureus and petiole scurf long persisting. . . . . **27**

**20** Petiole scales lustrous orange-brown, contrasting with the blackish cortex of the lower petiole parts, scurf soon caducous; hairs often present between the veins abaxially but not adaxially. . . . . ***C. delgadii***

– Petiole scales dull brown, petiole cortex dull brown to stramineous or yellow, if scales lustrous then sparse scurf persisting or replaced by hairs; hairs absent between the veins, or if hairs present then more abundant adaxially. . . **21**

**21** Squamellae on costules (and midveins) whitish to tan, appearing pale "en masse". . . . . **22**

– Squamellae on costules (and midveins) auburn to dark brown, appearing dark "en masse". . . . . **23**

**22** Costules and midveins abaxially with predominantly flat, rarely subbullate squamules with short tips and entire margins. – Central America. . . . . ***C. onusta***

– Costules and midveins abaxially with many subbullate to bullate squamules 1–3 mm long, tan to yellowish white, concolorous or weakly bicolorous with darker brown bases, with elongate tips and entire to weakly fimbriate margins. – Jamaica, Cuba, Haiti. . . . . ***C. furfuracea***

**23** Laminae usually sparsely hairy on both sides, or if pubescence evident then hairs more abundant abaxially and never between the veins. . . . . **24**

– Laminae usually evidently hairy on and between the veins on both sides, or if pubescence sparse then hairs more abundant adaxially. . . . . **25**

**24** Petiole scales 14–20 × 4.5–5.0 mm, concolorous orange-brown to reddish brown; costules with flat, lanceolate squamules with weakly fimbriate margins; laminae to 90–150 × 35–80 cm. – Caribbean. . . . . ***C. tenera*** (Hook.) T. Moore agg.

– Petiole scales 20–30 × 2.0–4.5 mm, concolorous to weakly concordantly bicolorous, the brown to dark brown centers

not sharply contrasting with the brown to yellowish orange margins; costules and midveins abaxially with flat squamules missing or rarely few with subentire margins; laminae to 250 × 100–130 cm. – Mesoamerica, northern Andes. . . . . ***C. fulva*** agg. (see Rojas 2001, 2005)

**25** Squamules on costules and midveins flat, with elongated tips and fimbriate to dissected margins, bullate squamules lacking; veins abaxially with many white, tortuous multicellular hairs 0.5–0.7 mm long on and between the veins. – Caribbean. . . . . ***C. harrisii*** Underw.

– Squamules on costules and midveins deeply bullate to sacculate; tortuous hairs lacking. – Andes. . . . . **26**

**26** Petioles aculeate to verrucate, with scarce scurf of brown squamellae and trichomidia; proximal segments of pinnules not covering the costules; pinnae mainly alternate. . . . . ***C. herzogii***

– Petioles inermous, scurf replaced by indument of white multicellular hairs to 2 mm long; proximal segments of pinnules partially covering the costules; central and lower pinnae opposite or nearly so. . . . . ***C. obnoxia*** Lehnert

**27** Laminar hairs more frequent adaxially than abaxially; pinnule bases notably cordate to auriculate. . . . ***C. maxonii***

– Laminar hairs more frequent abaxially than adaxially, but generally sparse; pinnule bases truncate to cuneate, not auriculate. . . . . **28**

**28** Scales of lower parts of petioles with relatively narrow blackish centers and broad ferrugineous to orange-brown margins that are confluent towards the tips; squamules of petiole scurf to 1.0 mm; rhachises with long-persistent bicolorous scales whose marginal color fades with age; largest pinnules sessile or nearly so (stalks 1 mm or less). . . . . ***C. catacampta***

– Scales of lower parts with relatively broad, dark brown to blackish centers, the marginal color not confluent towards the tips; squamules of petiole scurf to 0.5 mm; rhachises without scales or with ephemeral concolorous scales; largest pinnules often notably short-stalked to 3 mm. . . . . **29**

**29** Petiole scales narrowly lanceolate to lanceolate, 15–33 × 3.5–4.5 mm, the brown to dark brown centers not sharply set against the brown to orange margins, often appearing concolorous; laminar indument with mainly flat (rarely subbullate) squamules. . . . . ***C. lindeniana***

– Petiole scales relatively broadly lanceolate, to 15 × 4 mm, atropurpureus to blackish on the sides and the bases of the petioles, dark brown on upper petiole parts and towards the trunks, always with distinct lighter margins, brown to orange, rarely in parts yellowish or cream-white; laminar indument with flat and bullate squamules. . . . . ***C. squamipes***

**30** Trunks to 4 cm diameter, fertile plants less than 2 m tall, unfolding only one frond at a time, lacking stolons or lateral buds. . . . . **31**

– Trunks 5–25 cm diameter, fertile plants usually 2 m or taller; if smaller then trunk unfolding more than one frond at a time, lateral buds or stolons possible. . . . . **32**

**31** Petiole scurf scant, easily abraded and often absent in mature material; petiole scales broadly lanceolate to ovate, opaque white to very light brown, sometimes with a dark brown streak at tip. – Central Andes. . . . . ***C. bettinae***

– Petiole scurf well developed, persisting in mature material; petiole scales narrowly lanceolate to ovate-lanceolate, discordantly to concordantly bicolorous brown to dark brown with tan to whitish margins, distal scales broader and lighter in color than the basal ones. – Guyana Highlands. . . . . ***C. simplex*** R. M. Tryon

**32** Petiole scales very scarce and fugacious; lateral buds, stolons, or aerial roots in upper trunk parts common. . . . . (*C. xenoxyla* group) **11**

– Petiole scales numerous and long-persisting; lateral buds formed only after injury of the apex, stolons or aerial roots in upper trunk parts absent. . . . . **33**

**33** Petiole scales concolorous white, cream, stramineous, or tan, without continuous central streak. . . . . **34**

– Petiole scales at least at petiole bases bicolorous with continuous central streak, sometimes almost concolorous brown to dark brown or blackish. . . . . **35**

**34** Petiole scales relatively thick, firm, elastic; petiole scales and scurf squamules lacking long marginal cilia, but often with brown to dark brown marginal teeth. . . . ***C. straminea***

– Petiole scales thin, papyraceous, flexuous; petiole scales and scurf squamules without brown marginal teeth but with long marginal cilia not differently colored than the rest of the scale. . . . . ***C. atahuallpa***

**35** Laminar indument with linear-lanceolate squamules and small scales, both with fimbriate to ciliate margins and often transitional to branched hairs, small scales of the laminar indument concolorous and golden brown to orange-brown, or if not so then petioles with aphlebioid pinnae. . . . . **36**

– Laminar indument without linear-lanceolate squamules that are transitional to branched hairs (which may be present), usually with white, tan, or dark brown, ovate to lanceolate squamules and small scales, flat squamules of the laminar indument often bicolorous or with dark marginal teeth, squamules never golden brown to orange-brown and petioles always lacking aphlebioid pinnae. . . . . **37**

**36** Petioles without basal aphlebioid pinnae, clearly set apart from the elliptic laminae; bullate squamules with fimbriate margins present in the laminar indument; petiole scurf usually dense (but easily worn off), the squamules with marginal cilia longer than their bodies. . . . . ***C. patens***

– Petioles with pairs of basal aphlebioid pinnae, or if these absent then laminae either ± triangular or basally decurrent into a very short petiole; bullate squamules with entire margins; petiole scurf scarce and appressed, squamules with short hyaline cilia. . . . . ***C. parvifolia***

**37** Petiole scurf consisting of pale brown to tan, appressed to ascending, small squamules with fimbriate to ciliate margins, relatively sparse, never with dark marginal teeth nor transitional to larger petiole scales. . . . . **38**

– Petiole scurf consisting of erect, stramineous, cream, or white, lanceolate squamules, often transitional to larger petiole scales and/or with dark marginal teeth. . . . . **41**

**38** Petiole scurf consisting of small, isodiametric squamules with spreading marginal cilia (appearing like snowflakes or cottonballs). . . . . **39**

– Petiole scurf consisting of small flat, round to ovate-lanceolate squamules with paler marginal cilia, these not spreading. . . . . **40**

**39** Laminar indument without bullate squamules; petiole scurf squamules of more or less the same size; segments without hairs adaxially on the veins; leaf axes abaxially glabrous or glabrescent with sparse scurf; indusia very fragile and often ephemeral. . . . . ***C. tungurahuae***

– Laminar indument with bullate squamules; petiole scurf squamules of different sizes; segments with few to many hairs adaxially on the veins; leaf axes abaxially often densely covered with easily abraded white scurf; indusia fragile but usually persistent as fragments. . . . . ***C. cystolepis***

**40** Petiole scales dark brown, margins usually very narrow; hairs, if present, more abundant abaxially than adaxially; laminar indument with bullate squamules and white tortu-

ous hairs; petiole bases often with adventitious pinnae..... ***C. brachypoda***

– Petiole scales brown to pale brown with broad white margins; hairs, if present, more abundant adaxially or equally frequent on both laminar surfaces; laminar indument without bullate squamules or white tortuous hairs; petiole bases never with adventitious pinnae..... ***C. austropallescens***

**41** Petiole scurf diffuse, petiolar cortex visible between scurf and petiole scales; petiole scales with relatively firm, persistent margins; fronds sometimes with dark fungal infection visible as black spot between veins..... **42**

– Petiole scurf dense, obscuring petiolar cortex between petiole scales; petiole scales with brittle, fragmenting margins; laminae without black spots between the veins..... **43**

**42** Scurf squamules without dark marginal teeth but usually with cropped tips; petiole scales concordantly bicolorous to almost concolorous dark brown to blackish with white to pale brown margins; laminae usually with fungal infection visible as black spots between the veins..... ***C. dintelmannii*** Lehnert

– Scurf squamules often with dark marginal teeth; petiole scales only pale brown to brown, discordantly bicolorous with white to tan margins; laminae without black spots between the veins..... ***C. straminea***

**43** Largest pinnules notably stalked, stalk usually longer than width of basal segment; laminar indument absent to sparse (rarely strongly developed on leaf axes), appearing ± concolorous brown, consisting mainly of hyaline branched hairs with brown tips and thin concolorous brown squamellae; indusia brown, firm, persisting..... ***C. divergens***

– Largest pinnules sessile to subsessile, stalk length not reaching width of basal segment; laminar indument not appearing concolorous brown, either white or bicolorous; indusia light brown to colorless, persistent to ephemeral..... **44**

**44** Pinnules to 9.5–12 × 0.8–2.0 cm, mostly linear with acute tips; laminar indument consisting of strongly bicolorous dark brown squamules with white margins, smaller ones also with dark brown marginal teeth or concolorous dark brown; white bullate squamules mainly distally on the segments; indusia lustrous, tan to light brown, fragments usually persistent at maturity..... ***C. ruiziana*** Klotzsch

– Pinnules to 12–16 × 1.2–4.5 cm, mostly triangular with attenuate tips; laminar indument consisting of white dissected squamules and trichomidia, sometimes with small brown scales to 4 mm long with tan to white margins and dark brown marginal teeth scattered on costules; bullate squamules absent; indusia opaque to vaguely shiny, tan to white, transparent, fragile, often ephemeral..... ***C. corallifera***

## 4 List of exsiccatae

List to the exsiccatae consulted for this study (including type specimens and collections mentioned in the text). Collectors are arranged in alphabetical order; in the case of two or more co-collectors, these are abbreviated with "et al.". Reference to species in brackets; for consecutive collection numbers pertaining to the same species, the number is given only after the last collection. Collections without numbers are omitted if there are several collections belonging to different taxa (Karsten s. n., Wercklé s. n., Sodiro s. n.).

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# Woody angiosperm taxa of the Canarian laurel forests: Leaf morphology and cuticular structures

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Abstract

Systematic-taxonomic investigations of fossil foliage are based on leaf morphology including the details of higher order venation and on cuticular structures. These features are rarely taken into account for the determination of modern plant taxa. Hence, they are usually not included in the systematic literature. It has long been known that the laurel forests of the Canary Islands bear similarities to the Neogene European plant record. Here, we describe in detail the foliage morphology, especially the venation details and cuticular features, of the woody angiosperm taxa of the Canarian laurel forests (27 species/subspecies from 18 families). Additionally, possible ancestral plants of the European Neogene are discussed.

K e y w o r d s : Canary Islands, laurel forests, woody angiosperm taxa, cleared leaves, venation details, cuticle structures, determination of foliage, fossil record.

Zusammenfassung

Die systematisch-taxonomische Bestimmung fossiler Blätter erfolgt nach Blattmorphologie und Kutikularstrukturen. Diese Merkmale werden jedoch bei der Bestimmung rezenter Pflanzen kaum jemals berücksichtigt und sind in der Bestimmungsliteratur meist nicht enthalten. Seit langem ist bekannt, dass die Zusammensetzung der Lorbeerwälder der Kanarischen Inseln Ähnlichkeiten zu den Pflanzengemeinschaften Europas während des Neogens aufweisen. In dieser Arbeit wird nun erstmals die Blattmorphologie der Gehölze der kanarischen Lorbeerwälder (27 Arten/Unterarten aus 18 Familien) beschrieben und dabei spezielles Augenmerk auf Feinnervatur und Kutikularstrukturen gelegt. Anschließend werden ihre möglichen Vorläufer diskutiert.

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## 1 Introduction

The determination of modern plants is more strongly based on generative than on vegetative features. Details of leaf morphology, especially venation details and cuticular features, are rarely included in the description of modern species. Klucking (1986–1995) dealt extensively with leaf venation patterns on the family level but did not go deeper than to the second-order venation. Högermann (1987) dealt with Lauraceae from tropical Venezualian Guyana. The fossil plant record is hampered by the detachment and fragmentation of the plant organs prior to fossilisation. Leaf assemblages are common in the fossil record, and the systematic assignment of detached plant organs is largely based on comparison with corresponding organs of modern plants. Consequently, there is a strong need to describe the morphological foliar features of modern plant species, especially venation details along with cuticular structures.

Traditionally, comparative investigations for the systematic identification of fossil plants usually start with different modern species of one genus, largely disregarding their habitat. The present approach, however, starts from the sociological viewpoint: species that co-occur in one forest type today. The argument for this procedure is the fact that the composition of Paleogene and Neogene plant assemblages shows strong relations to different forest types of the northern hemisphere, e. g. broad-leaved evergreen forests, mixed mesophytic forests or broad-leaved deciduous forests.

The Canarian laurel forests have often served for comparison with the Neogene European plant record, but leaf morphological and cuticular traits of their taxa remained largely unexamined. In this study we therefore focus on leaf morphology and cuticle structures of the woody taxa of the Canarian laurel forests. This is designed to enlarge our knowledge of diagnostic foliar features and to provide a sound basis for further comparisons of the fossil plant record.

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## 2 Material and methods

### Material

All leaves investigated here derive from herbarium material housed in the State Museum of Natural History Stuttgart (STU). A big part has been specially collected by the second author for comparison with the fossil record (here herbarium Eder). Most cuticle preparations were performed from this material.

### Preparation techniques

For the investigation of the venation details, cleared leaves were prepared. The methods described by Foster (1952) modified by Hickey (1973), the method of Payne (1969) modified by Sheffy (1972) and a recipe of Wolfe used by Dilcher (1974) were initially applied. None of them was appropriate for the hard and resistant leaves of the laurel forest taxa. An optimised method was therefore developed based on the tested techniques. The proposed bleaching substance chloral hydrate was replaced by ordinary chloral bleach. The proposed cooking of the samples was abandoned because it caused shrinkage and in some cases severely damaged the foliage. The mounting of the leaves between two glass plates in glycerine gelatine was replaced by mounting in glycerol and coverage by a thin plastic wrap. This enabled samples to be taken at a later time. The method has been described in detail by Rasche & Kovar-Eder (2008).

Cuticle preparation was performed with Schulze's reagents ($KClO_3$ plus $HNO_3$), subsequent rinsing in water, followed by treatment in a 5 %-solution of KOH and renewed rinsing in water. The cuticles were stained with Safranin, mounted in glycerol-gelatine and sealed with nail polish.

### Descriptions

Descriptions of gross morphology and venation follow the "Manual of Leaf Architecture" (Wing et al. 1999), that of cuticles Dilcher (1974) and Stace (1965). Stoma and trichome frequency are calculated using Dilcher's formula of $I=(S/(E+S))*100$ for an area of 100 µm² where S is the number of stomata or trichomes per area and E is the corresponding number of non-modified epidermal cells.

In every taxon, 20 measurements for leaf size and petiole length were taken from at least five different herbarium sheets (the exact number of herbarium sheets is given with the specific description). Ten measurements were taken for every cuticular cell type, if possible from three different herbarium sheets. Minimum and maximum values are given along with mean values in brackets. Five measurements of the distances between the secondary veins were measured in one leaf.

When selecting the herbarium material for this study, high priority was given to cover species variability. Nevertheless, the herbarium material did not enable clear differentiation between canopy and understorey leaves or unambiguous distinction of material from different exposures, e. g. north/south exposed ridges, slopes, valleys. That these environmental parameters may influence leaf morphology and physiology has recently been demonstrated by Ohsawa & Nitta (1999). Kvaček (2004) added that non-modified epidermal cells of understorey leaves are bigger than those of canopy leaves and more often show undulations. Therefore, the parameter ranges given in the descriptions probably reflect trends and ranges rather than full character variability.

### Photographic documentation

The cleared leaves were examined under a Novex Holland-binocular microscope, photos of details were taken through a phototube. For the photos of the entire leaves, the slides were put on a phototable with transmitted light. All photos were taken with a Nikon Coolpix 4500.

The cuticles were examined under a Leica DM R-microscope with interference contrast, and photos were taken with a Canon PowerShot S45 digital camera through a phototube. Measurements were performed on the digital photos using the software Leica IM50.

### General layout

In chapter 3, families, genera and species/subspecies are arranged in alphabetical order. In the figure captions numbers of herbarium sheets are given in brackets; the little arrow in the figures points towards the leaf apex.

## 3 Systematic part

### Aquifoliaceae

### *Ilex canariensis* Poiret
(Figs. 1–7)

Material: Herbarium Eder nos. 18, 31, 32, 57–59, 60, 65 (16 herbarium sheets, cuticles from 8 sheets).

Leaf attachment alternate, leaf organization simple, petiole 1.0–1.8 cm (1.3 cm) long, marginal petiolar attachment, laminar size microphyll – 2 : 1, length 2.7–10.2 cm (7.3 cm), width 1.5–4.5 cm (3.3 cm), shape elliptic, symmetrical, base and apex angle both acute, base and apex shape convex, margin entire or serrate, revolute; tooth shape: basal side retroflexed (= apically convex, basally concave), apical side concave, sinus rounded, apex spinose, a veinlet running directly in the tooth apex.

Venation: primary vein pinnate; secondaries festooned brochidodromous, in most cases recurved, sometimes straight, secondary vein spacing irregular, 0.6–1.0 cm, secondary vein angle smoothly decreasing towards the base, inter-secondaries not developed; tertiaries random reticulate, admedially ramified; fourth-order veins alternate percurrent, areolation well developed; fifth-order veins dichotomizing; freely ending ultimate veinlets twice or more times branched, ultimate marginal venation consisting of incomplete loops.

Adaxial cuticle: thick, glabrous, non-modified epidermal cells 21–67 µm (36 µm) in diameter, anticlines undu-

late to almost straight, undulation U-shaped, wave length 16–32 µm (24 µm), amplitude 7–12 µm (10 µm); surface sometimes striate. Marginal cells polygonal, rarely elongated, 19–58 µm (39 µm) long, anticlines straight, cell surface occasionally striate.

Abaxial cuticle: thick, glabrous, non-modified epidermal cells 18–48 µm (39 µm) in diameter, shape variable, anticlines strongly undulate to almost straight, undulation U-shaped, wave length 13–24 µm (19 µm), amplitude 4–21 µm (10 µm); stomatal complexes cyclocytic to incomplete amphicyclocytic; subsidiary cells slightly elongated tangentially; stomata roundish to oval, 26–48 µm (32 µm) long, 23–37 µm (29 µm) wide, polar I-pieces slender, outer stomatal ledges thick; stomatal aperture oval, 13–29 µm (20 µm) long; stomata frequently arranged in groups partly sharing the outer ring of subsidiary cells; stomatal frequency 20, stomata less densely spaced when the anticlines of the non-modified epidermal cells are almost straight; few giant stomata observed, size about 45 × 35 µm, non-modified epidermal cells surrounding the giant stomata thicker than normal; distinct idiocuticular foldings developed, running almost circular around the stomata; cork warts also occasionally developed, surrounding epidermal cells thickened, sometimes flattened and tangentially oriented around the warts.

Remarks: Differential features of this species from the following are the recurved secondaries, the admedially ramified tertiaries, and the ultimate marginal venation, which is composed of incomplete loops.

*Ilex platyphylla* Webb & Berthet
(Figs. 8–14)

Material: Herbarium Eder nos. 10, 56 (11 herbarium sheets, cuticles from 2 sheets).

Leaf attachment alternate, leaf organization simple, petiole 0.8–1.5 cm (1.0 cm) long, marginal petiolar attachment, laminar size notophyll – 2 : 1, length 8.4–13.7 cm (10.8 cm), width 3.7–8.0 cm (5.9 cm), shape elliptic, symmetrical, base and apex angle both acute, base shape rounded, apex shape acuminate, forming a spinose apex, margin entire or serrate, revolute, almost always one tooth per centimetre, spacing almost regular, tooth shape: basal side convex, apical side concave, sinus rounded to nearly angular, apex spinose.

Venation: primary vein pinnate; secondaries festooned brochidodromous, near their origin somewhat recurved to straight, near the margin somewhat convex, secondary vein spacing irregular, 0.6–1.5 cm, secondary vein angle rather uniform, inter-secondaries developed; tertiaries alternate to opposite percurrent, straight to convex, tertiary vein angle to primary vein obtuse to acute, tertiary vein angle decreasing exmedially; fourth-order veins regular polygonal reticulate, areolation moderately developed (4- to more-sided); fifth-order veins dichotomizing; freely ending ultimate veinlets twice or more times branched, ultimate marginal venation a fimbrial vein.

Adaxial cuticle: thick, glabrous, non-modified epidermal cells 17–44 µm (29 µm) in diameter, anticlines straight or weakly undulate, undulation U-shaped, wave length 16–24 µm (19 µm), amplitude 6–11 µm (8 µm). Marginal cells polygonal to elongated and linear, 18–55 µm (34 µm) long, 13–34 µm (19 µm) wide, anticlines straight to weakly undulate.

Abaxial cuticle: thick, glabrous, non-modified epidermal cells 14–38 µm (26 µm) in diameter, anticlines straight or undulate, undulation U-shaped, wave length 13–22 µm (17 µm), amplitude 3–8 µm (5 µm); stomatal complexes – sometimes incomplete – amphicyclocytic, anticlines of subsidiary cells straight, even when surrounded by non-modified epidermal cells with undulate anticlines, subsidiary cells staining more intensely than non-modified cells, 13–37 µm (23 µm) long, 5–12 µm (8 µm) wide; stomata wide oval, 27–37 µm (33 µm) long, 20–29 µm (25 µm) wide, poles sometimes marked by thickened I-piece; stomatal aperture wide oval, 15–21 µm (17 µm) long, outer stomatal ledges well developed; stomata frequently arranged in groups of two to five; stomatal frequency 8, stomata less densely spaced when the anticlines of non-modified epidermal cells are straight; giant stomata present (one observed, 48 × 37 µm); large, multicellular cork warts occasionally developed.

Remarks: The foliage of *I. platyphylla* differs from *I. canariensis* by marginal teeth with a spinose apex, the presence of intersecondaries and a fimbrial vein. The cuticular features of both species are very similar and are not suitable for specific differentiation.

## Caprifoliaceae

*Sambucus nigra* L. ssp. *palmensis* (Link) Bolli
(Figs. 15–20)

Material: Herbarium Eder nos. 48, 49 (6 herbarium sheets, cuticles from 2 sheets).

Leaf attachment opposite, odd-pinnately compound, 7 to 9 leaflets, petiole 6.7–13.5 cm (10.2 cm) long, pilose, laminar size mesophyll – 1.5 : 1, leaves 8.3–22.8 cm (14.6 cm) long, 6–10 cm (11 cm) wide; leaflets: petiolule of the terminal one usually about 1 cm long, petiolule of the lateral leaflets 0.2–0.3 cm long, marginal petiolar attachment, leaflet size microphyll – 2 : 1; leaflets 3.7–9.5 cm (6.8 cm) long, 1.6–3.9 cm (2.9 cm) wide, shape elliptic to

ovate, base symmetrical to asymmetrical, base and apex angle both acute, base shape convex to rounded, apex shape straight to slightly convex; margin simple to occasionally double serrate, 4 teeth per centimetre on average, rather regularly spaced; tooth shape: basal side convex to flexuous (= basally convex, apically concave), apical side straight to flexuous, sinus angular, apex mucronate.

Venation: primary vein pinnate; secondaries curved and somewhat zig-zag, festooned semicraspedodromous, secondary vein spacing 0.5–1.3 cm, decreasing towards the base, no inter-secondaries developed; tertiaries partly alternate to opposite percurrent, partly reticulate, generally widely spaced, tertiary vein course variable, tertiary vein angle to primary vein obtuse to acute, tertiary vein angle inconsistent; fourth-order veins regular polygonal reticulate, areolation weakly developed (mostly 5-sided); fifth-order veins dichotomizing; freely ending ultimate veinlets unbranched to once branched, ultimate marginal venation consisting of incomplete loops, a veinlet running directly in the tooth apex.

Adaxial cuticle: extremely delicate, non-modified epidermal cells not always visible, if recognizable widely U- to Ω-shaped undulate. Surface finely striate, striae running in rather parallel bundles. Two types of trichomes developed: one-celled conical trichomes positioned above very large simple, roundish bases (see Fig. 20), base diameter > 80 µm, trichome body > 500 µm long, fine but distinct striation developed around the trichome base and on the lower part of the trichome body, furthermore pluricellular club-shaped glandular trichomes developed, 117–139 µm (130 µm) long, head 51–65 µm (58 µm) wide and 61–95 µm (77 µm) long (Fig. 18).

Abaxial cuticle: also very delicate, non-modified epidermal cells hardly visible on the cuticle; stomatal complexes probably anomocytic; stomata elliptic, 14–35 µm (22 µm) long, 9–21 µm (14 µm) wide; stomatal aperture elliptic, 8–24 µm (14 µm) long, outer stomatal ledges well developed and strongly staining; both trichome types as described above present, surface finely striate.

Remarks: Isolated leaflets of *S. nigra* ssp. *palmensis* may be mistaken for a Rosaceae species. Characteristic for *S. nigra* ssp. *palmensis* is the low number of secondaries resulting from the relatively wide spacing and the rather coarse pattern of the tertiaries. The most remarkable cuticular features are the extremely large trichome bases and the very long trichomes.

### *Viburnum tinus* L. ssp. *rigidum* (Vent) Silva (Figs. 21–27)

Material: Herbarium Eder nos. 20, 33, 34 (5 herbarium sheets, cuticles from 3 sheets).

Leaf attachment opposite, leaf organization simple, petiole 1.5–2.1 cm (1.9 cm) long, densely pilose, marginal petiolar attachment, laminar size notophyll – 2 : 1, length 6.9–15.0 cm (9.9 cm), width 3.4–7.3 cm (5.2 cm), shape elliptic, symmetrical to asymmetrical, base angle obtuse, apex angle acute, base shape convex, apex shape slightly convex to almost straight, margin entire to erose; lower leaf surface densely pubescent, especially on veins, occasionally axillary domatia developed, upper leaf surface less densely pubescent; two types of trichomes present: simple long filiform and shorter stellate ones.

Venation: primary vein pinnate; secondaries smoothly curved, festooned brochidodromous, secondary vein spacing irregular, 1.3–2.5 cm, secondary vein angle decreasing towards the base, inter-secondaries developed; tertiaries mixed opposite/alternate percurrent, tertiary vein course straight, convex or sinuous, tertiary veins sometimes hardly distinguishable from inter-secondaries, tertiary vein angle to primary vein slightly acute to almost perpendicular, tertiary vein angle uniform; fourth-order veins alternate percurrent, towards the margin polygonal reticulate, areolation moderately to weakly developed (mostly 4-sided); fifth-order veins dichotomizing; freely ending ultimate veinlets unbranched to once branched, ultimate marginal venation consisting of loops; all veins protuberant and densely pilose.

Adaxial cuticle: thick, non-modified epidermal cells polygonal, 16–47 µm (28 µm) in diameter, anticlines straight to undulate, undulation U-shaped, wave length 15–26 µm (19 µm), amplitude 4–7 µm (5 µm); very characteristic trichome bases present, diameter 49–99 µm (74 µm), densely spaced, mainly upon veins, consisting of (5) 6–7 (8) radially arranged cells and one or more central cells, outer margin of trichome base thickened, occasionally surrounded by slender, tangentially elongated epidermal cells; additionally, small, simple, thickened trichome bases scattered, diameter 13–22 µm (17 µm). Marginal cells rectangular, rather slender long and short cells randomly alternating, 22–70 µm (39 µm) long, 9–22 µm (14 µm) wide, oblique or horizontal anticlines; trichome bases as described above.

Abaxial cuticle: thinner than adaxial one, non-modified epidermal cells 8–43 µm (24 µm) in diameter, anticlines straight or undulate, undulation U-shaped, wave length 16–38 µm (24 µm), amplitude 5–11 µm (7 µm); stomatal complexes brachypara- to incompletely paracytic; stomata slender oval, 21–31 µm (27 µm) long, 17–27 µm (21 µm) wide; stomatal aperture oval, 11–19 µm (15 µm) long, outer stomatal ledges smooth and slightly thickened; stomatal frequency 21; trichome bases scattered as on the adaxial cuticle, both complex and simple ones, simple ones sometimes with a basal trichome body remnant still adhering.

Remarks: At a first glance this foliage may be mistaken for a laurel species. The stomatal complexes are paracytic, as in the Lauraceae. Distinctive features are the more asymmetrical leaf shape, the presence of freely ending ultimate veinlets, the pilosity, the trichome types and the absence of oil cells in the mesophyll. The multicellular trichome bases may be correlated to the stellate trichomes, while the simple bases probably derive from the simple filiform ones.

## Celastraceae

### *Maytenus canariensis* Kunkel & Sunding
(Figs. 28–33)

Material: STU 5336, 862 (5 herbarium sheets, cuticles from 2 sheets).

Leaf attachment opposite, leaf organization simple, petiole 0.5–1.0 cm (0.8 cm) long, base slightly swollen, marginal petiolar attachment, laminar size microphyll – 2 : 1, length 4.5–10.0 cm (6.4 cm), width 2.4–4.4 cm (3.2 cm), laminar shape elliptic, symmetrical, base and apex angle both acute, base shape concavo-convex, apex shape convex; margin serrate to crenate, 3–4 teeth per centimetre, rather regularly spaced; tooth shape: basal side retroflexed, apical side concave, sinus rounded, apex non-specific glandular, a veinlet ending directly in the tooth apex.

Venation: primary vein pinnate; secondaries curved, festooned semicraspedodromous, curved and slightly wavy, secondary vein spacing 0.4–1.9 cm, decreasing towards the base, secondary vein angle relatively uniform, inter-secondaries weakly developed; tertiaries opposite to alternate percurrent, tertiary vein course sinuous, tertiary vein angle to primary vein almost perpendicular, tertiary vein angle decreasing exmedially; fourth-order veins regular polygonal reticulate, areolation poorly developed (4- to > 7-sided); fifth-order veins dichotomizing; freely ending ultimate veinlets twice or more times branched, ultimate marginal venation consisting of incomplete loops.

Adaxial cuticle: thick, glabrous, non-modified epidermal cells mostly penta- to hexagonal, 16–42 µm (27 µm) in diameter, anticlines straight to very slightly curved or undulate. Marginal cells with the same characteristics as mentioned above but slightly smaller, 6–26 µm (13 µm) long.

Abaxial cuticle: thick, glabrous, non-modified epidermal cells 12–43 µm (23 µm) in diameter, anticlines straight, sometimes slightly wavy; stomatal complexes anisocytic, anomotetracytic to cyclocytic, subsidiary cells almost identical to normal epidermal cells; stomata oval, 21–27 µm (25 µm) long, 18–27 µm (22 µm) wide; stomatal aperture short, slender oval, 9–15 µm (11 µm) long, poles thickened; stomatal frequency 12–19 (15).

Remarks: The foliage resembles to some degree that of *Visnea mocanera*. It may be distinguished by the rather regular spacing of the secondaries, the regular meshes of the tertiary veins, and by the smaller stomata.

## Ericaceae

### *Arbutus canariensis* Veill.
(Figs. 34–40)

Material: Herbarium Eder nos. 28, 29 (10 herbarium sheets, cuticles from 2 sheets).

Leaf attachment alternate, leaf organization simple, petiole 1.2–2.0 cm (1.6 cm) long, covered by (long) glandular trichomes, (stalk variable in length, head rounded) extending into the basal part of the lamina mainly along the midvein and the leaf margin, marginal petiolar attachment, leaf size notophyll – 3 : 1, length 9.4–17.0 cm (13.4 cm), width 2.5–6.0 cm (4.3 cm), elliptic to obovate, symmetrical, base and apex angle both acute, base shape straight to cuneate, apex shape convex; margin crenate to serrate, teeth variable in size and shape, densely spaced, basal side convex or straight, apical side concave, straight or retroflexed, sinus almost angular or rounded, apex rounded to acute, partly non-glandular, partly non-specific glandular.

Venation: primary vein pinnate; secondaries semicraspedodromous, straight to moderately curved, secondary vein spacing dense, 0.3–0.6 cm, course not evenly parallel among each other, secondary vein angle relatively uniform, inter-secondaries occasionally developed; tertiaries alternate percurrent, tertiary vein course sinuous, tertiary vein angle to primary vein obtuse, tertiary vein angle decreasing exmedially; fourth-order veins reticulate to opposite percurrent, areolation moderately developed (5-sided); fifth-order veins dichotomizing; freely ending ultimate veinlets unbranched to twice branched, ultimate marginal venation consisting of incomplete loops, veinlets running towards the teeth either ending in the sinus or the apex or sometimes touching first the sinus and ending finally in the apex.

Adaxial cuticle: moderately thick, non-modified epidermal cells almost isodiametric, 12–34 µm (23 µm) in diameter, polygonal, anticlines straight, cuticle striation developed above veins and often short epicuticular foldings on single cells. Rarely, simple, roundish, thick-walled trichome bases present, diameter 16–30 µm (23 µm), two- to three- (to four-?)celled trichome bases scattered, trichome bodies absent. Marginal cells elongated, long and short cells randomly alternating, 13–39 µm (24 µm) long, 7–13 µm (9 µm) wide, anticlines straight, end anticlines square to oblique.

Abaxial cuticle: thinner than adaxial one, glabrous, non-modified epidermal cells elongated to polygonal, 10–

35 µm (21 µm) in diameter, anticlines straight to rounded; epicuticular striation sometimes developed over veins and in intercostal areas, running concentrically upon guard cells; stomatal complexes cyclocytic with a ring of 6–8 elongated and slender subsidiary cells similar to non-modified epidermal cells but more intensively staining; stomata roundish to oval, 24–39 µm (31 µm) long, 17–32 µm (24 µm) wide; stomatal aperture oval to spindle-shaped, 13–21 µm (17 µm) long, outer stomatal ledges slightly thickened; stomatal frequency 11–20 (15), stomata clustered in distinct groups; giant amphicyclocytic stomatal complexes present, two observed 47 × 26 µm and 25 × 20 µm, surrounded by radially oriented striation.

Remarks: The gross morphology of this foliage is fairly characteristic due to the densely spaced secondaries and the uniform, dense, partly glandular crenation/serration. In addition, the characteristic cyclocytic stomatal complexes with intensively staining subsidiaries and the striation are valuable diagnostic features. The scattered multicelled trichome bases on the adaxial cuticle probably stem from glanduliferous trichomes that are developed mainly on the petiole but extend somewhat into the lamina and which are visible on the blade using a hand lens.

## Euphorbiaceae

### *Euphorbia mellifera* Ait.
(Figs. 41–45)

Material: STU 7179, 15070 (5 herbarium sheets, cuticles from 2 sheets).

Leaf attachment alternate, leaves concentrated at the end of the branch, leaf organization simple, petiole 0.3–1.8 cm (0.9 cm) long, marginal petiolar attachment, laminar size microphyll – 5–6 : 1, length 5.4–16.6 cm (12.2 cm), width 1.1–2.8 cm (2.0 cm), shape slender oblong, symmetrical, base and apex angle both acute, base shape straight to decurrent, apex shape straight to slightly convex, leaf blade merges into the petiole, margin entire.

Venation: primary vein pinnate; secondaries already very thin and poorly visible, straight to slightly curved, weakly brochidodromous, secondary vein spacing increasing towards the base, 0.3–0.4 cm, secondary veins arising almost perpendicular, inter-secondaries occasionally developed; tertiaries dichotomizing, tertiary vein course admedially ramified, tertiary vein angle to primary vein acute, tertiary vein angle uniform, areolation rare to poorly developed (many-sided); fourth-order veins dichotomizing; fifth-order veins not developed; freely ending ultimate veinlets twice or more times branched, ultimate marginal venation consisting of incomplete loops.

Adaxial cuticle: delicate, glabrous, non-modified epidermal cells polygonal, 17–46 µm (28 µm) in diameter, anticlines straight to very slightly zig-zag undulate, wave length 13–22 µm (18 µm), amplitude 2–5 µm (4 µm). Hypodermis well developed.

Abaxial cuticle: delicate, glabrous, non-modified epidermal cells penta- to hexagonal, 15–35 µm (25 µm) in diameter, anticlines undulate (U-shaped), wave length 9–15 µm (13 µm), amplitude 2–4 µm (3 µm); stomatal complexes brachypara-, para- or anisocytic, subsidiary cells less intensively staining than non-modified epidermal cells; stomata oval, 17–23 µm (20 µm) long, 20–25 µm (23 µm) wide; stomatal aperture slender spindle-shaped, 11–12 µm (12 µm) long, outer stomatal ledges bordering the apertures distinct; stomatal frequency 13.

Remarks: Remarkable are the indistinct secondary veins arising almost perpendicular to the midvein. The tertiaries are already dichotomizing, as are the fourth-order veins, but fifth-order veins are not developed.

## Hypericaceae

### *Hypericum canariense* L.
(Figs. 46–51)

Material: Herbarium Eder no. 21 (5 herbarium sheets, cuticle from one sheet).

Leaf attachment opposite, leaf organization simple, petiole very short to almost sessile, base swollen, marginal petiolar attachment, laminar size nanophyll – 3 : 1, length 4.4–6.5 cm (5.4 cm), width 0.8–1.5 cm (1.0 cm), elliptic, symmetrical, base and apex angle both acute, base shape cuneate, apex shape straight, margin entire and occasionally revolute; mesophyllous resinuous globuli abundant, resolving during the preparation of the cleared leaf.

Venation: primary vein pinnate; secondaries curved, festooned brochidodromous, running in variable courses across the lamina, secondary vein spacing irregular, 0.3–0.6 cm, secondary vein angle smoothly decreasing towards the base, inter-secondaries occasionally developed; tertiaries already weakly developed, mixed opposite/alternate percurrent, tertiary vein course almost straight, tertiary vein angle to primary vein obtuse to perpendicular, tertiary vein angle inconsistent, poorly developed; fourth-order veins dichotomizing; fifth-order veins not developed, areolation poorly developed; freely ending ultimate veinlets twice or more times branched, ultimate marginal venation consisting of incomplete loops.

Adaxial cuticle: delicate, glabrous, non-modified epidermal cells rather isodiametric, quadrangular to hexagonal, 12–25 µm (18 µm) in diameter, anticlines thick and straight. Marginal cuticle thicker than adaxial cuticle,

marginal cells slightly elongated, end anticlines square to rounded, 19–46 µm (28 µm) long, 8–16 µm (11 µm) wide.

Abaxial cuticle: delicate, glabrous, non-modified epidermal cells polygonal, 11–28 µm (18 µm) in diameter, anticlines slender and straight; stomatal complexes paracytic, but sometimes instead of one lateral cell two may be developed; stomata slender elliptic, 11–20 µm (16 µm) long, 7–12 µm (10 µm) wide, partly overlapped by neighbouring cells, epidermal wall of guard cells mostly not visible; stomatal aperture slender oval, 5–11 µm (9 µm) long; stomatal frequency 21.

Remarks: *H. canariensis* is distinguishable from other entire-margined species of the Canarian laurel forests by its nanophyll laminar size (length/width ratio 3 : 1). Although very distinct in leaf gross morphology, *Hypericum canariense* and *H. grandifolium* are similar in their cuticular structure regarding the rather small paracytic stomatal complexes.

*Hypericum grandifolium* Choisy
(Figs. 52–57)

Material: Herbarium Eder nos. 6, 35 (5 herbarium sheets, cuticles from 2 sheets).

Leaf attachment opposite, leaf organization simple, petiole very short to almost sessile, marginal petiolar attachment, laminar size microphyll – 1.5 : 1, length 3.2–6.3 cm (4.5 cm), width 1.8–3.8 cm (2.6 cm), ovate, symmetrical, base angle obtuse, apex angle acute, base shape rounded, apex shape convex, margin entire.

Venation: primary vein pinnate; secondaries thick, brochidodromous, running in wide and smooth curves across the lamina, secondary vein spacing decreasing towards the base, 0.8–1.4 cm, inter-secondaries hardly developed; tertiaries mixed opposite/alternate percurrent, tertiary vein course straight, convex to slightly sinuous, tertiary vein angle to primary vein slightly acute to almost perpendicular, tertiary vein angle rather inconsistent; fourth-order veins regular polygonal reticulate; fifth-order veins forming polygons or dichotomizing, areolation well developed; freely ending ultimate veinlets unbranched to once branched, ultimate marginal venation consisting of loops.

Adaxial cuticle: delicate, glabrous, non-modified epidermal cells quadrangular to polygonal, 11–41 µm (22 µm) in diameter, anticlines straight. Marginal cells slightly elongated, linear, end anticlines square to oblique, 35–189 µm (87 µm) long, 10–25 µm (17 µm) wide.

Abaxial cuticle: delicate, glabrous, non-modified epidermal cells dome-shaped, rather variable in diameter, 17–38 µm (22 µm), anticlines straight to rounded; stomatal complexes anomocytic; stomata oval to spindle-shaped, partially overlapped by non-modified epidermal cells, 8–26 µm (16 µm) long, 4–18 µm (11 µm) wide; stomatal aperture narrow, 9–19 µm (14 µm) long; stomatal frequency 13.

Remarks: Isolated leaves of *H. grandifolium* may be mistaken for laurel foliage. However, these leaves are almost sessile, and their shape is distinctly ovate with a rounded base. Contrary to Lauraceae, they show unbranched or once branched freely ending ultimate veinlets and no oil cells in the mesophyll. The stomatal complex type is paracytic as in the Lauraceae, but the stomata are smaller than in the laurel family.

Lauraceae

*Apollonias barbujana* (Cav.) Born.
(Figs. 58–63)

Material: Herbarium Eder nos. 5, 17, 45 (13 herbarium sheets, cuticles from 3 sheets).

Leaf attachment alternate to almost opposite, leaf organization simple, petiole 0.6–2.6 cm (1.2 cm) long, marginal petiolar attachment, laminar size notophyll – 2 : 1, length 7.8–16.0 cm (10.5 cm), width 2.8–6.8 cm (4.1 cm), elliptic to slightly obovate, symmetrical, base and apex angle both acute, base shape cuneate, apex shape acuminate, margin entire to finely erose; mesophyllous resinuous bodies present but small and indistinct, discernible vaguely only in the cleared leaf; leaf blade may show bulges caused by mites.

Venation: primary vein pinnate; secondaries curved, festooned brochidodromous, secondary vein spacing rather regular, 0.7–1.1 cm, one pair of acute basal secondaries, inter-secondaries developed; tertiaries almost regular polygonal reticulate to alternate percurrent, tertiary vein course straight, convex or sinuous, tertiary vein angle inconsistent; fourth-order veins regular polygonal reticulate, forming the areoles; no fifth-order veins developed; freely ending ultimate veinlets absent, ultimate marginal venation a fimbrial vein.

Adaxial cuticle: thick, glabrous, non-modified epidermal cells 12–34 µm (19 µm) in diameter, tri- to pentagonal, anticlines sometimes undulate (U-shaped), partly knobbed or thickened and sometimes with double contour, wave length of undulation 14–27 µm (20 µm), amplitude 3–9 µm (5 µm). Marginal cells slender elongated with oblique end anticlines, 85–209 µm (138 µm) long, 10–31 µm (19 µm) wide.

Abaxial cuticle: medium thick to thick, glabrous, non-modified epidermal cells 9–40 µm (19 µm) in diameter, penta- to hexagonal, anticlines partly knobbed or thickened and sometimes with double contour but more weakly

developed than adaxially, anticlines rather straight, sometimes weakly U-shaped undulate, wave length 12–29 µm (19 µm), amplitude 3–8 µm (5 µm); stomatal complexes paracytic, subsidiary cells staining exactly as the non-modified epidermal cells, shape triangular to square, partly overlapping the guard cells; stomata 15–27 µm (22 µm) long, 9–25 µm (16 µm) wide; stomatal aperture slit-like, deeply staining, 6–11 µm (8 µm) long; stomatal frequency 15. Epidermal secretory cells developed above veins recognizable by their very thin cuticle.

Remarks: Among entire-margined coriaceous foliage, that of Lauraceae is distinctive by either the absence or poor development of ultimate veinlets in the areoles. In *A. barbujana* the tertiaries form a fine and rather regular polygonal network, contrary to *Laurus azorica* and *Ocotea foetens*. Regarding the cuticular structures, the Canarian laurel species are well distinguishable from each other. Though paracytic, the stomatal complexes are of quite different shape in all four species. For *A. barbujana* the occasional presence of epidermal secretory cells on the abaxial cuticle and anticlines with double contour are noteworthy.

### *Laurus azorica* (Seub.) Franco
(Figs. 64–69)

Material: Herbarium EDER nos. 4, 11, 38, 55 (16 herbarium sheets, cuticles from 4 sheets).

Leaf attachment alternate, leaf organization simple, petiole 0.5–2.5 cm (1.5 cm) long, marginal petiolar attachment, laminar size notophyll – 2 : 1, length 7–16 cm (10.7 cm), width 2.4–8.2 cm (4.4 cm), elliptic, symmetrical, base and apex angle both acute, base shape convex to complex, apex shape convex to rounded, margin entire, mesophyllous secretory bodies well developed.

Venation: primary vein pinnate, pilose, abaxially axillary glanduliferous domatia developed mainly along the primary vein but also occasionally in axils of higher order veins; secondaries curved, weakly brochidodromous, secondary vein spacing irregular, 0.6–1.2 cm, two pairs of short acute basal secondaries, inter-secondaries occasionally developed; tertiaries mixed opposite/alternate percurrent, tertiary vein course sinuous, tertiary vein angle to primary vein obtuse, tertiary vein angle increasing basally; fourth-order veins regular polygonal reticulate; fifth-order veins regular polygonal reticulate, areolation well developed (mostly 4- to 5-sided); freely ending ultimate veinlets absent to unbranched, ultimate marginal venation a fimbrial vein.

Adaxial cuticle: thick, non-modified epidermal cells 19–61 µm (35 µm) in diameter, anticlines strongly Ω-shaped undulate, wave length 14–33 µm (21 µm), amplitude 6–15 µm (10 µm); simple trichome bases present, often situated upon veins, trichome pore round to slightly elongated, cells surrounding the pore thicker and more deeply staining than non-modified epidermal cells. Marginal cells elongated with oblique end anticlines, becoming undulate in transition to ad- and abaxial cuticle, 15–58 µm (39 µm) long, 10–20 µm (16 µm) wide.

Abaxial cuticle: thick, non-modified epidermal cells 10–66 µm (34 µm) in diameter, anticlines strongly undulate, undulation Ω-shaped, wave length 5–15 µm (9 µm), thus smaller than adaxially, amplitude 4–12 µm (7 µm); trichome bases with the same characteristics as described above; stomatal complexes paracytic, mostly rhomboidal, 23–40 µm (32 µm) long, 19–47 µm (28 µm) wide; subsidiary cells less intensively staining than non-modified epidermal cells; stomatal aperture a slender slit, 14–25 µm (18 µm) long, poles often indented and sometimes marked by a T-piece of thickened cutin; stomatal frequency 28.

Remarks: In *L. azorica* two basal pairs of slender, steeply ascending secondaries are noteworthy, as is the presence of axillary glanduliferous domatia on the lower leaf surface. During the clearing process the trichomes become detached and only axillary depressions remain visible. Among the Lauraceae of the Canary Islands, FERGUSON (1974) mentions the existence of hairs on young leaves. They have entirely disappeared by the time the leaf is mature, leaving behind trichome bases that mark their point of leaf attachment.

### *Ocotea foetens* (Ait.) Baill.
(Figs. 70–75)

Material: Herbarium EDER no. 47 (13 herbarium sheets, cuticle from one sheet).

Leaf attachment alternate, leaf organization simple, petiole 0.9–2.0 cm (1.3 cm) long, marginal petiolar attachment, laminar size notophyll – 2 : 1, length 8.3–13.5 cm (11.1 cm), width 3.3–6.4 cm (4.8 cm), oblong to elliptic, symmetrical, base and apex angle both acute, base shape straight to slightly convex, apex shape convex to acuminate, margin entire, mesophyllous resinuous bodies present.

Venation: primary vein pinnate; secondaries curved, festooned brochidodromous, secondary vein spacing rather regular, 1.1–2.0 cm, secondary vein angle relatively uniform, 2–3 distinct domatia in the axils of the lower secondaries, each covering an axillary gland, intersecondaries present; tertiaries regular polygonal reticulate, tertiary vein course straight to curved; fourth-order veins regular polygonal reticulate; fifth-order veins regular polygonal reticulate or dichotomizing, areolation well developed (4- to 5-sided); freely ending ultimate veinlets

absent to once branched, ultimate marginal venation formed by loops.

Adaxial cuticle: thick, non-modified epidermal cells polygonal, diameter 12–23 µm (18 µm), anticlines clear cut and straight; simple roundish pores (?trichome bases, Fig. 75) rarely present, diameter about 13 µm. Marginal cells elongated, distinctly linear with horizontal anticlines, 12–34 µm (25 µm) long, 8–15 µm (12 µm) wide.

Abaxial cuticle: medium thick, non-modified epidermal cells centrally thickened, elongated, diameter 7–38 µm (21 µm), anticlines straight, rounded or weakly undulate, undulation U-shaped, wave length 10–20 µm (15 µm), amplitude 3–7 µm (5 µm); stomatal complexes paracytic, appearing broadly oval to almost square, 19–28 µm (23 µm) long, 17–28 µm (22 µm) wide; stomatal aperture short, narrow and spindle-shaped, 10–14 µm (12 µm) long, bordered by extremely thickened cuticular ledges; stomatal frequency 14; giant stomata present (one observed, 34 × 33 µm); sometimes trichome bases present as described above.

Remarks: For this Lauraceae, big domatia in the basal part of the lamina are distinctive. The tertiaries are regular polygonal reticulate, whereas they are percurrent in *Laurus azorica* and *Persea indica* and alternate percurrent to random reticulate in *Apollonias barbujana*.

*Persea indica* (L.) Spreng
(Figs. 76–82)

Material: Herbarium EDER nos. 15, 16, 44 (13 herbarium sheets, 3 cuticles).

Leaf attachment alternate, leaf organization simple, petiole 1.3–3.3 cm (2.4 cm) long, marginal petiolar attachment, laminar size mesophyll – 3 : 1, length 9.5–20.2 cm (15.2 cm), width 3.0–7.5 cm (5.2 cm), elliptic to oblong, symmetrical, base occasionally asymmetrical, base and apex angle both acute, base shape concavo-convex to decurrent, apex shape almost straight to slightly convex or acuminate, margin entire and revolute.

Venation: primary vein pinnate; secondaries brochidodromous, smoothly curved, secondary vein spacing rather regular, 0.6–1.2 cm, secondary vein angle almost uniform, inter-secondaries developed; tertiaries mixed opposite/alternate percurrent, tertiary vein course almost straight to sinuous, tertiary vein angle to primary vein obtuse, tertiary vein angle decreasing exmedially; fourth-order veins opposite to alternate percurrent; fifth-order veins regular polygonal reticulate, areolation well developed (4- to 6-sided); freely ending ultimate veinlets absent to unbranched, ultimate marginal venation consisting of loops.

Adaxial cuticle: moderately thick, glabrous, non-modified epidermal cells polygonal, very variable in size, 9–40 µm (19 µm), anticlines distinct and straight. Marginal cells elongated, linear with horizontal to oblique end anticlines, anticlines of adjoining non-modified epidermal cells often thickened; trichomes simple, one-celled, 27–142 µm (60 µm) long.

Abaxial cuticle: thinner than adaxial one, pubescent, non-modified epidermal cells dome-shaped, diameter 7–27 µm (19 µm), anticlines straight to smoothly rounded; stomatal complexes paracytic; stomata oval to rhomboidal, overlapped by surrounding cells, frequently asymmetrical, 13–23 µm (19 µm) long, 12–27 µm (16 µm) wide; stomatal aperture a slender, spindle-shaped slit, 7–15 µm (10 µm) long, often indistinct; stomatal frequency 15; anticlines of adjoining non-modified epidermal cells often thickened, one-celled trichome bases rather densely spaced, intensively staining, shape roundish to oval, diameter 8–17 µm (12 µm), trichome 10–30 µm (20 µm) long, 7–16 µm (11 µm) wide.

Remarks: Among the laurels on the Canary Islands, *P. indica* is the only deciduous one, characterized by an occasionally asymmetrical leaf base, denser and more regular spacing of secondary veins as well as by the very regular pattern of the percurrent tertiaries. Mesophyllous resinuous bodies are absent. On the abaxial cuticle the non-modified epidermal cells are dome-shaped, overlapping the stomata. This feature is also known from the fossil *Laurophyllum acutimontanum* Mai. An indumentum of simple and short trichomes is developed especially on the abaxial surface.

Myricaceae

*Myrica faya* Ait.
(Figs. 83–88)

Material: Herbarium EDER nos. 14, 22, 36, 37, 51–53, 61 (15 herbarium sheets, cuticles from 8 sheets).

Leaf attachment alternate, leaf organization simple, short petiole 0.2–1.0 cm (0.7 cm), marginal petiolar attachment, laminar size microphyll – 3 : 1, length 4.3–10.4 cm (6.6 cm), width 1.1–3.1 cm (2.1 cm), elliptic, symmetrical, base and apex angle both acute, base shape decurrent, apex shape concave to almost straight, margin crenate, serrate, almost entire to slightly erose, revolute, 2–5 teeth per centimetre, spacing irregular; tooth shape: basal side convex or retroflexed, apical side convex or straight, sinus angular, apex weakly spinose on serrate leaves, teeth often non-specific glandular.

Venation: primary vein pinnate; secondaries festooned brochidodromous, almost straight to moderately curved, secondary vein spacing 0.4–0.8 cm, one pair of acute basal secondaries, inter-secondaries present; tertiaries regular

polygonal reticulate; fourth-order veins regular polygonal reticulate; fifth-order veins dichotomizing or forming polygons, areolation well developed (4- to 5-sided); freely ending ultimate veinlets unbranched to twice branched, ultimate marginal venation consisting of loops; as variable as the leaf margin is the venation of the teeth: veinlets may run into the sinus and the apex, but loops may also enter the teeth and approach the sinus, sometimes from such loops veinlets arise that enter the sinus or the apex.

Adaxial cuticle: medium thick, non-modified epidermal cells polygonal, sometimes nearly isodiametric, diameter 10–33 µm (21 µm), anticlines straight and distinct. Two-celled, well-cutinized, oval to roundish trichome bases present, diameter 12–29 µm (20 µm), peltate, glandular trichomes ca. 60–80 µm in diameter, surrounding epidermal cells less intensively staining than non-modified epidermal cells; marginal cells identical, anticlines slightly more rounded, 11–26 µm (20 µm) wide, trichome bases as mentioned above.

Abaxial cuticle: medium thick, non-modified epidermal cells polygonal, diameter 9–28 µm (18 µm), anticlines straight to curved or wavy; stomatal complexes anomocytic; stomata roundish, 20–34 µm (28 µm) in diameter, guard cells deeply staining; stomatal aperture often formed like the greek Φ; outer stomatal ledges raised and deeply staining; stomatal frequency variable, 6 to 11 (9); two-celled trichome bases slightly bigger than on the adaxial cuticle, 21–33 µm (27 µm) in diameter.

Remarks: Isolated foliage of *M. faya* may be easily identified by the two-celled bases of peltate glandular trichomes characteristic for the whole genus.

## Myrsinaceae

### *Heberdenia excelsa* (Ait.) Banks ex DC.
(Figs. 89–94)

Material: STU 7559, 9258 (5 herbarium sheets, cuticles from 2 sheets).

Leaf attachment alternate, leaf organization simple, short petiole 0.4–1.2 cm (0.7 cm), marginal petiolar attachment, laminar size notophyll – 2 : 1, length 5.9–14.8 cm (9.1 cm), width 2.6–5.2 cm (4.1 cm), elliptic, symmetrical, base and apex angle both acute, base shape almost cuneate, apex shape convex, margin entire but slightly wavy; big roundish to oval mesophyllous resinuous bodies are located in the poorly developed areoles.

Venation: somewhat erratic in appearance, primary vein pinnate; secondaries festooned brochidodromous, slightly recurved near the primary vein, secondaries sometimes forking in very different distances from the primary vein, running somewhat fluttery across the lamina, secondary vein spacing rather dense, irregular, 0.1–0.5 cm, secondary vein angle slightly increasing towards the base, one pair of very short acute basal secondaries, intersecondaries developed; tertiaries regular polygonal reticulate to mixed opposite/alternate percurrent, tertiary vein course sinuous to straight, tertiary vein angle inconsistent, areolation poorly developed; fourth-order veins dichotomizing; fifth-order veins not developed; freely ending ultimate veinlets unbranched to twice or more times branched, ultimate marginal venation consisting of both complete and incomplete loops.

Adaxial cuticle: medium thick, glabrous, non-modified epidermal cells polygonal, diameter variable, 10–33 µm (19 µm), less strongly cutinized and somewhat bigger (secretory?) cells scattered, anticlines thick, straight to slightly curved; marginal cells with the same attributes.

Abaxial cuticle: medium thick, non-modified epidermal cells polygonal, diameter variable, 13–51 µm (27 µm), anticlines thick, straight to somewhat curved; stomatal complexes mostly anisocytic, rarely anomotetracytic; stomata oval to almost round, 16–28 µm (20 µm) long, 13–23 µm (18 µm) wide; stomatal aperture also oval to almost round, 7–12 µm (9 µm) long, outer stomatal ledges thickened and raised, poles with thickened T-piece; stomatal frequency 21; scattered are peltate trichomes, head multicellular, diameter 22–43 µm (31 µm), cells radially arranged, segment-shaped, trichome bases more or less roundish, relatively small, 20–28 µm (23 µm), one-celled, strongly thickened, surrounded by normal-sized but slightly thickened epidermal cells.

Remarks: Distinctive venation features are the densely spaced, basally recurved and forking secondaries that loop in rather heterogeneous distances from the margin, causing a somewhat irregular venation picture. Already fourth-order veins dichotomize, whereas fifth-order veins are absent and areolation is hardly developed. Small peltate trichomes are also developed in the following species, *Pleiomeris canariensis*.

### *Pleiomeris canariensis* (Willd.) DC.
(Figs. 95–100)

Material: STU 8665, 579 (5 herbarium sheets, cuticles from 2 sheets).

Leaf attachment alternate, leaf organization simple, petiole short, 0.5–1.4 cm (1.0 cm) long, marginal petiolar attachment, laminar size mesophyll – 3 : 1, length 11.9–24.6 cm (17.7 cm), width 3.9–7.6 cm (6.0 cm), elliptic, symmetrical, base and apex angle both acute, base shape slightly concavo-convex to almost cuneate, apex shape almost straight to convex, margin entire to slightly erose and sometimes revolute.

Venation: primary vein pinnate; secondaries weakly brochidodromous, curved, secondary vein spacing rather dense and more or less regular, 0.5–1.1 cm, secondary vein angle almost uniform, one to two inter-secondaries well developed, one to several intersecondaries between two secondaries; tertiaries regular polygonal reticulate, forming the well developed areolation (mostly 4-sided); fourth-order veins dichotomizing; no fifth-order veins developed; freely ending ultimate veinlets absent to unbranched to twice branched, ultimate marginal venation consisting of loops.

Adaxial cuticle: thick, glabrous, non-modified epidermal cells 20–50 µm (31 µm) in diameter, anticlines undulate (U-shaped), wave length 15–28 µm (21 µm), amplitude 4–9 µm (6 µm). Marginal cells slightly elongated, anticlines straight to rounded, not arranged in distinct rows, 11–39 µm (22 µm) long, 8–26 µm (14 µm) wide.

Abaxial cuticle: thick, non-modified epidermal cells 17–57 µm (32 µm) in diameter, anticlines curved to undulate (U-shaped), wave length 19–31 µm (22 µm), amplitude 4–7 µm (6 µm); stomatal complexes anisocytic to anomotetracytic, subsidiaries hardly distinguishable in staining from non-modified epidermal cells but only about half the size; stomata oval to roundish, 17–23 µm (20 µm) long, 13–24 µm (18 µm) wide, poles indented and marked by a T-piece of cutin; stomatal aperture oval, 5–10 µm (7 µm) long, outer stomatal ledges thickened; stomatal frequency 16; peltate trichomes scattered, diameter 25–39 µm (34 µm), numerous narrow, radially arranged, segment-shaped cells forming the head, trichome bases one-celled, strongly thickened, diameter 11–22 (18 µm).

Remarks: The foliage is bigger than in *H. excelsa*; secondaries and intersecondaries are densely spaced, forming a very regular pattern. The secondaries are not recurved as in *Heberdenia excelsa*. A network of tertiaries is hardly distinctive from higher order venation. Remarkable is the small size of the stomata compared to the size of the non-modified epidermal cells.

## Oleaceae

### *Jasminum odoratissimum* L.
(Figs. 101–106)

Material: Herbarium Eder no. 27 (7 herbarium sheets, cuticle from one sheet).

Leaf attachment alternate, leaf organization ternate or less frequently odd-pinnate (5 leaflets), petiole winged, 1.8–4.0 cm (2.7 cm) long, marginal petiolar attachment, laminar size microphyll – 1 : 1, 3.6–6.8 cm (5.0 cm) long, 3.0–8.1 cm (5.2 cm) wide, ovate, symmetrical, base angle obtuse, apex angle acute.

Leaflets: petiolule of terminal leaflet 1.0–1.2 cm, of lateral leaflets 0.2 cm, marginal petiolar attachment, leaflet size microphyll – 2 : 1, 2.0–5.2 cm (3.6 cm) long, 0.9–2.8 cm (1.7 cm) wide, leaflets elliptic to somewhat ovate, terminal leaflet symmetrical, lateral leaflets base asymmetrical (apical side shorter), both base and apex angle acute, base shape concavo-convex and convex, apex shape slightly convex to straight, margin entire.

Venation: primary vein pinnate; secondaries (weakly) festooned brochidodromous, straight to slightly curved, the basal pair of secondaries ascending quite close to the leaf margin, secondary vein spacing rather irregular, 0.4–1.4 cm, secondary vein angle decreasing towards the base, inter-secondaries well developed; tertiaries regular polygonal reticulate; fourth-order veins regular polygonal reticulate or dichotomizing, almost identical to the dichotomizing fifth-order veins, areolation moderately developed (4- to 5-sided), freely ending ultimate veinlets unbranched to twice or more times branched, ultimate marginal venation consisting of sometimes complete, sometimes incomplete loops.

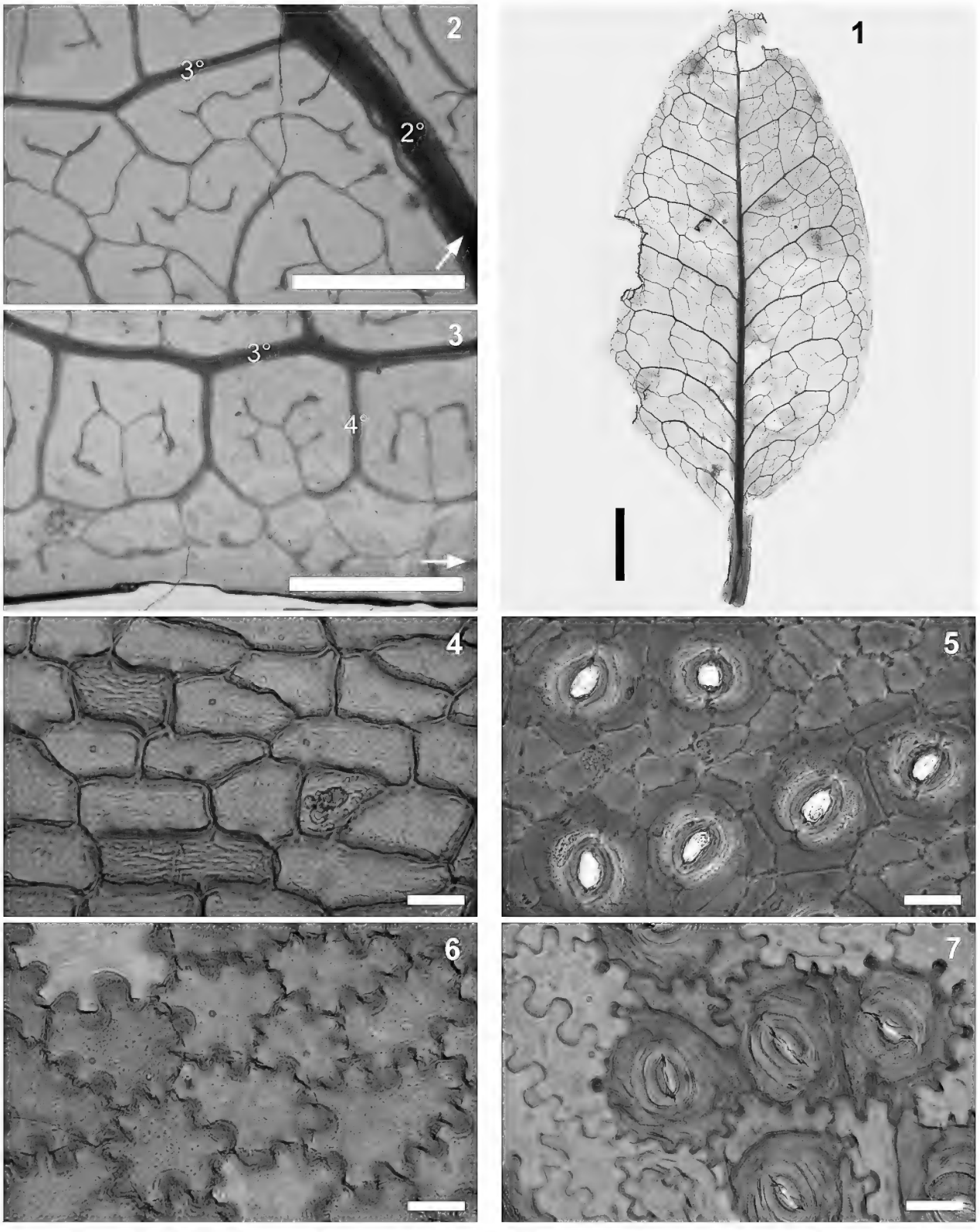
Adaxial cuticle: medium thick, non-modified epidermal cells often almost isodiametric, polygonal, 12–33 µm (23 µm) in diameter, centrally thickened, anticlines almost straight; trichome bases scattered in intercostal areas, base thickened, simple and roundish or polygonal, diameter 17–30 µm (20 µm). Marginal cells slightly elongated, anticlines straight to slightly rounded, 11–36 µm (21 µm); trichome bases as described above.

Abaxial cuticle: medium thick, non-modified epidermal cells polygonal, diameter 14–33 µm (21 µm), anticlines straight; stomatal complexes brachyparacytic, but sometimes two lateral subsidiaries instead of one, subsidiaries slightly less staining than non-modified epidermal cells; stomata oval, 23–33 µm (27 µm) long, 18–25 µm (23 µm) wide, sometimes partly overlapped by subsidiary cells; aperture oval, 12–20 µm (16 µm) long, poles marked by thickened I-piece of cutin; stomatal frequency 12; trichome bases as described above.

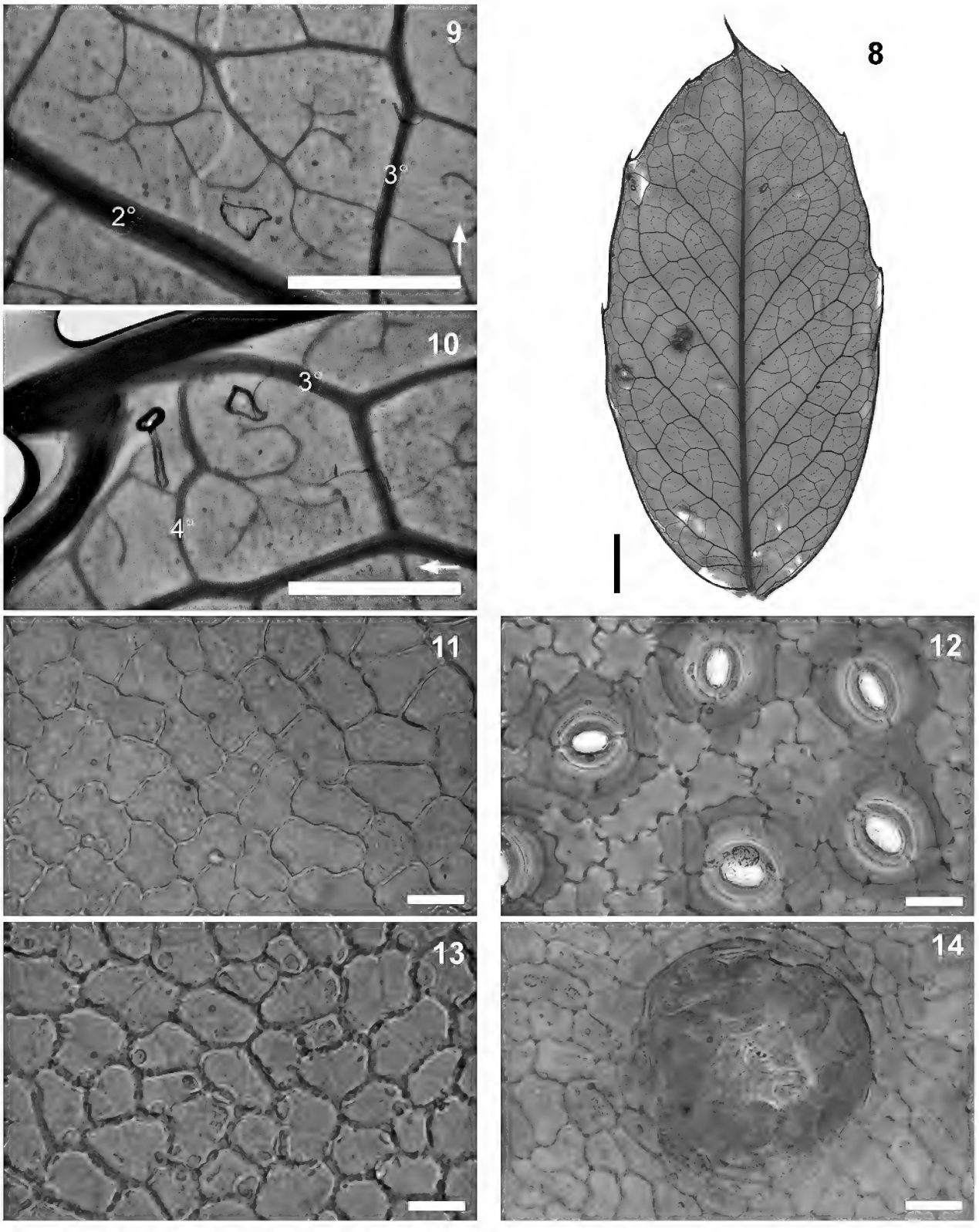
Remarks: This is the only species with ternate foliage. Isolated lateral leaflets are easily recognizable by their strongly asymmetrical base, terminal leaflets are distinguishable from other entire-margined foliage by the smaller laminar size. Moreover, *J. odoratissmum* differs from Lauraceae foliage by the presence of un- to multi-branched, freely ending ultimate veinlets.

### *Picconia excelsa* (Ait.) DC.
(Figs. 107–116)

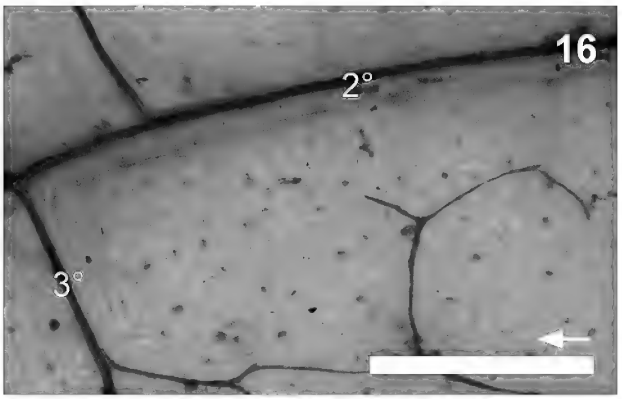
Material: Herbarium Eder nos. 23, 24, 40–43 (20 herbarium sheets, cuticles from 6 sheets).

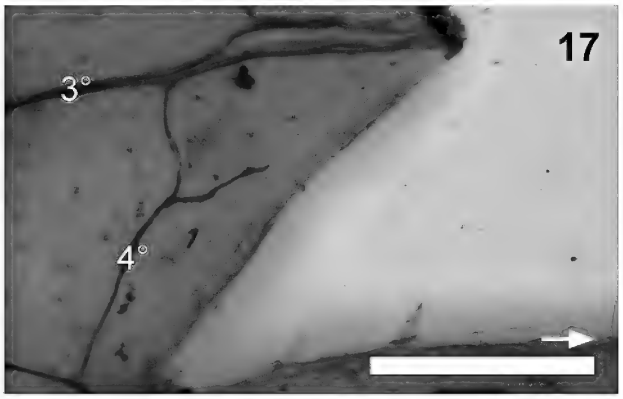


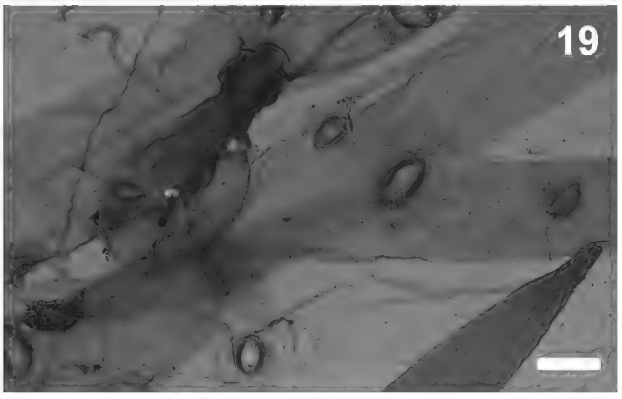

**Figs. 1–7.** *Ilex canariensis*. – **1**. Cleared leaf [32]. **2**. Secondary to fifth-order veins, freely ending ultimate veinlets dichotomizing [32]. **3**. Ultimate marginal venation, incomplete loops [32]. **4**. Margin [31]. **5**. Abaxial cuticle, straight anticlines [60]. **6**. Adaxial cuticle [65]. **7**. Abaxial cuticle, undulate anticlines [65]. – Scales: 1 cm (1), 1 mm (2–3), 25 µm (4–7).

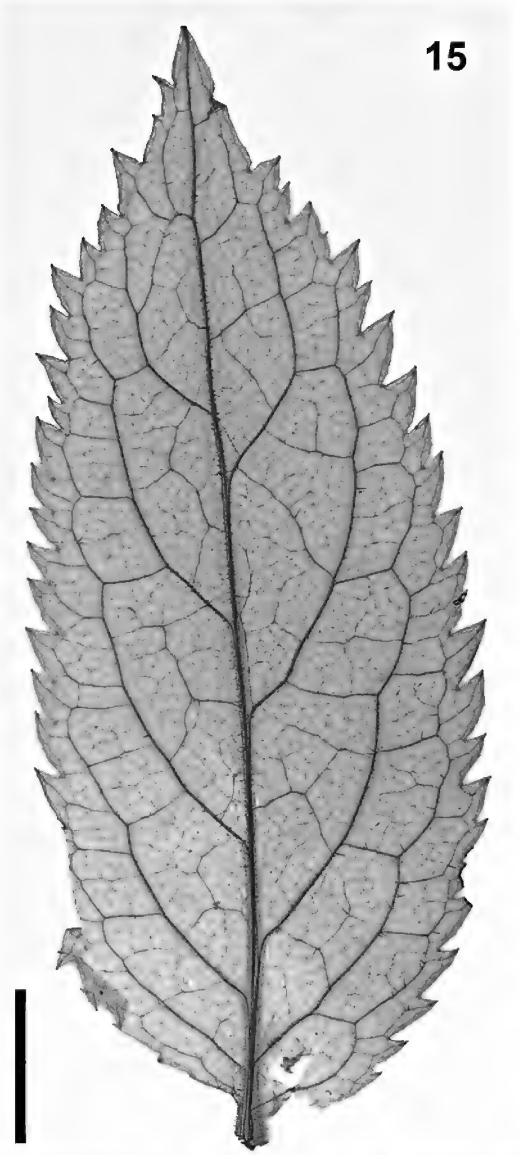


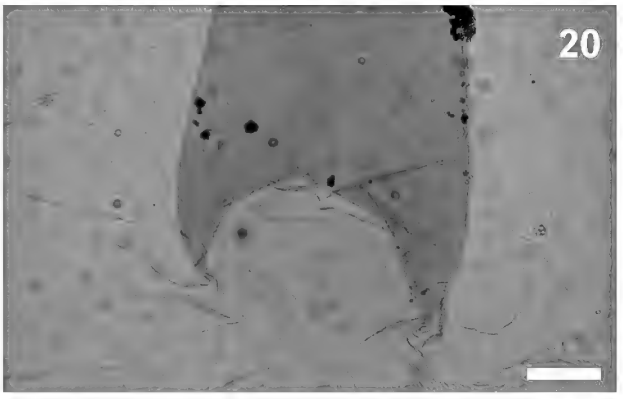

**Figs. 8–14.** *Ilex platyphylla*. – **8**. Cleared leaf [10]. **9**. Secondary to fifth-order veins [10]. **10**. Ultimate marginal venation, fimbrial vein [10]. **11**. Margin, transition of undulate to straight anticlines [10]. **12**. Abaxial cuticle [10]. **13**. Adaxial cuticle [56]. **14**. Abaxial cuticle, multicellular cork-wart [10]. – Scales: 1 cm (8), 1 mm (9–10), 25 µm (11–14).



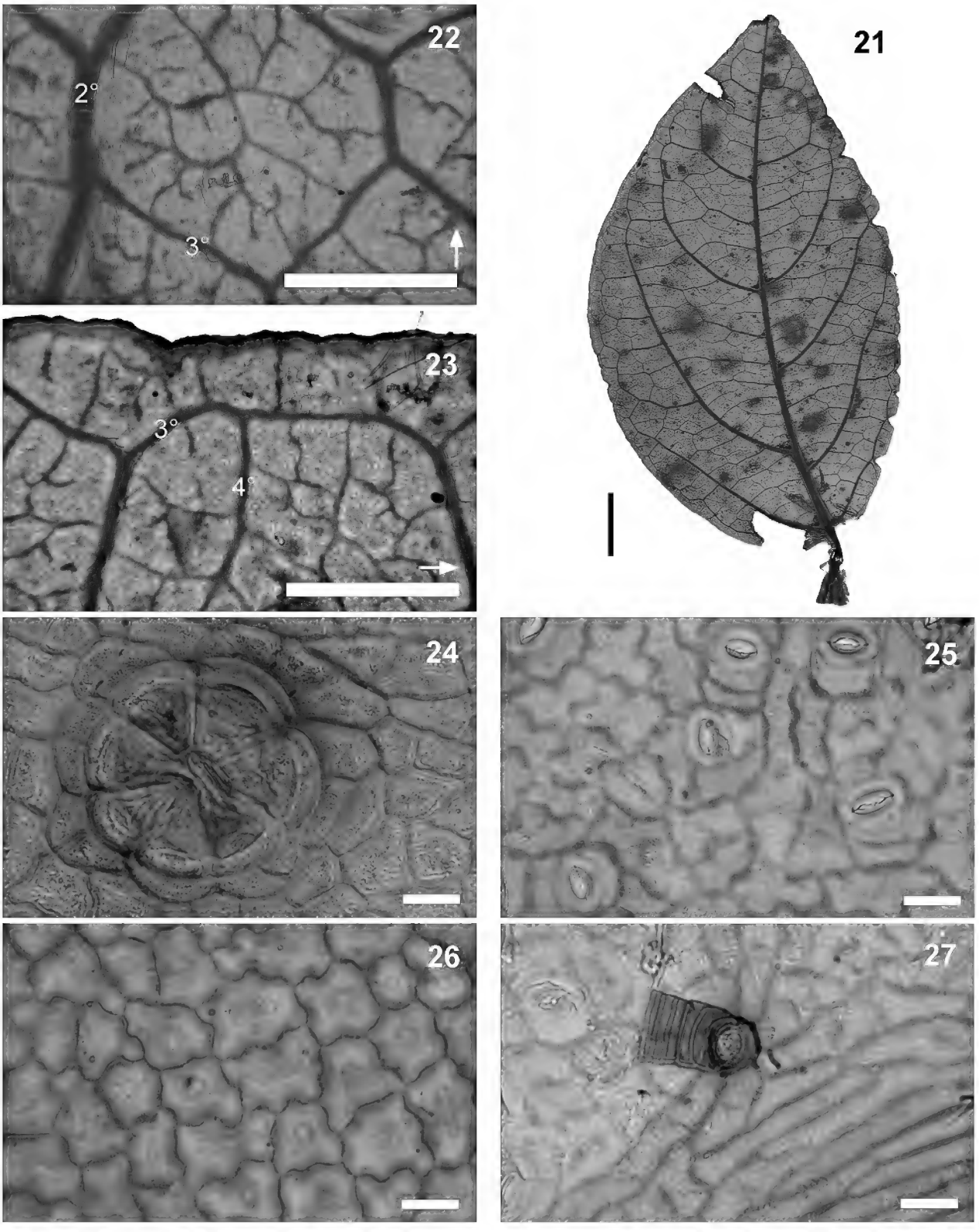





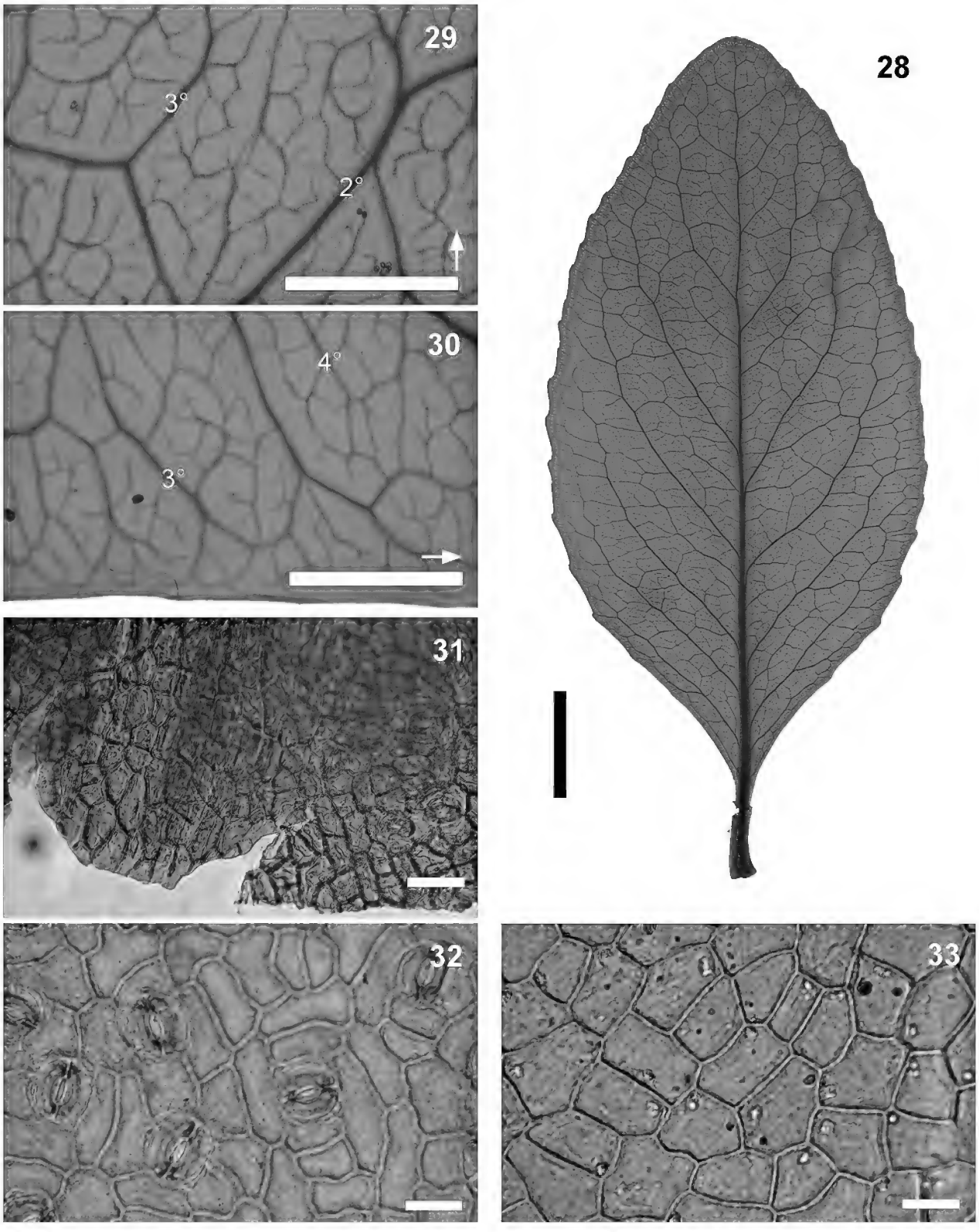



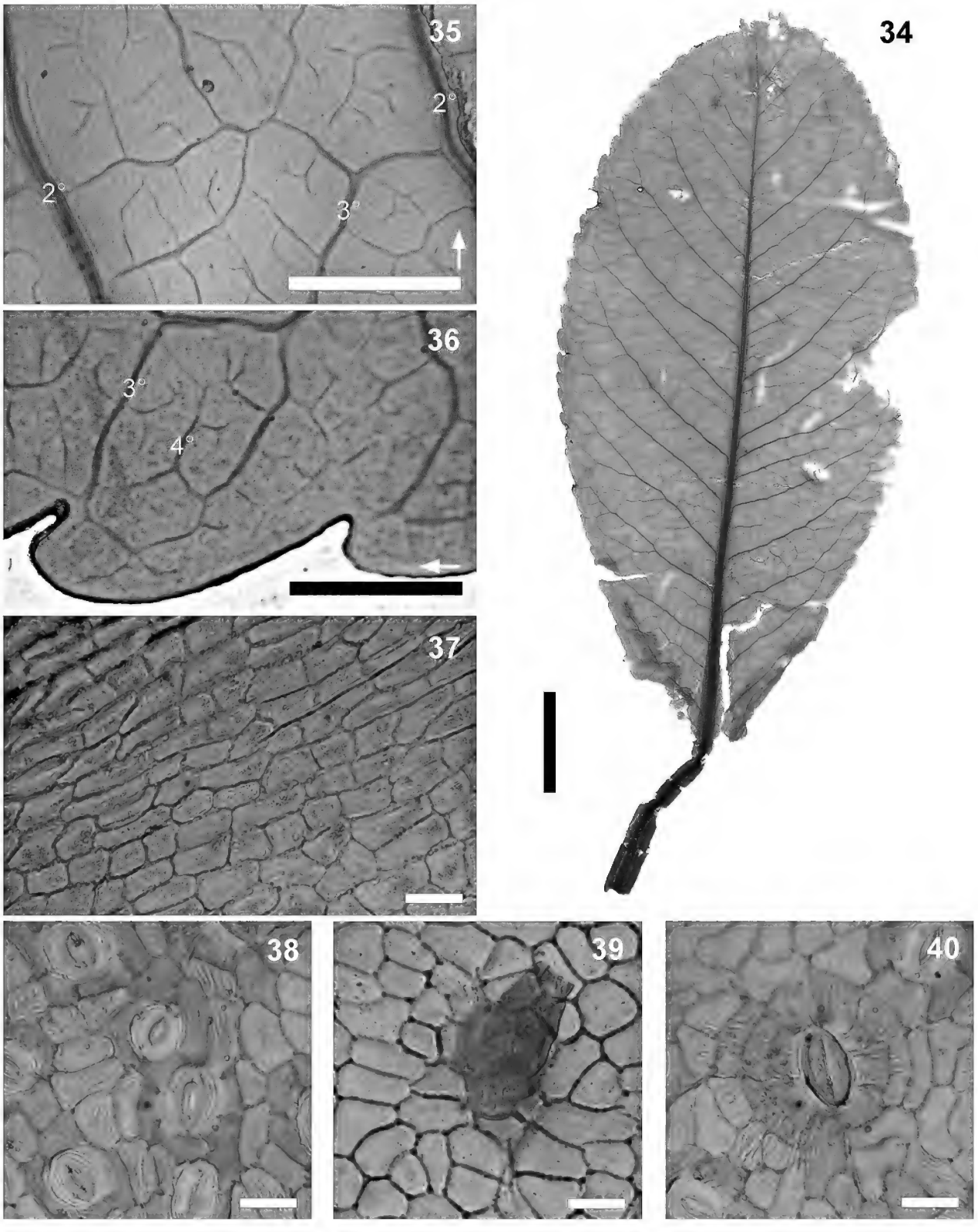

**Figs. 15–20.** *Sambucus nigra* ssp. *palmensis*. – **15**. Cleared leaf [49]. **16**. Secondary to fifth-order veins, freely ending ultimate veinlets dichotomizing [49]. **17**. Ultimate marginal venation, incomplete loops, tooth [49]. **18**. Adaxial cuticle, glandular trichome, striation [48]. **19**. Abaxial cuticle, stomata, glandular trichome, simple trichomes [48]. **20**. Adaxial cuticle, trichome, trichome base [48]. – Scales: 1 cm (15), 1 mm (16–17), 25 µm (18–20).



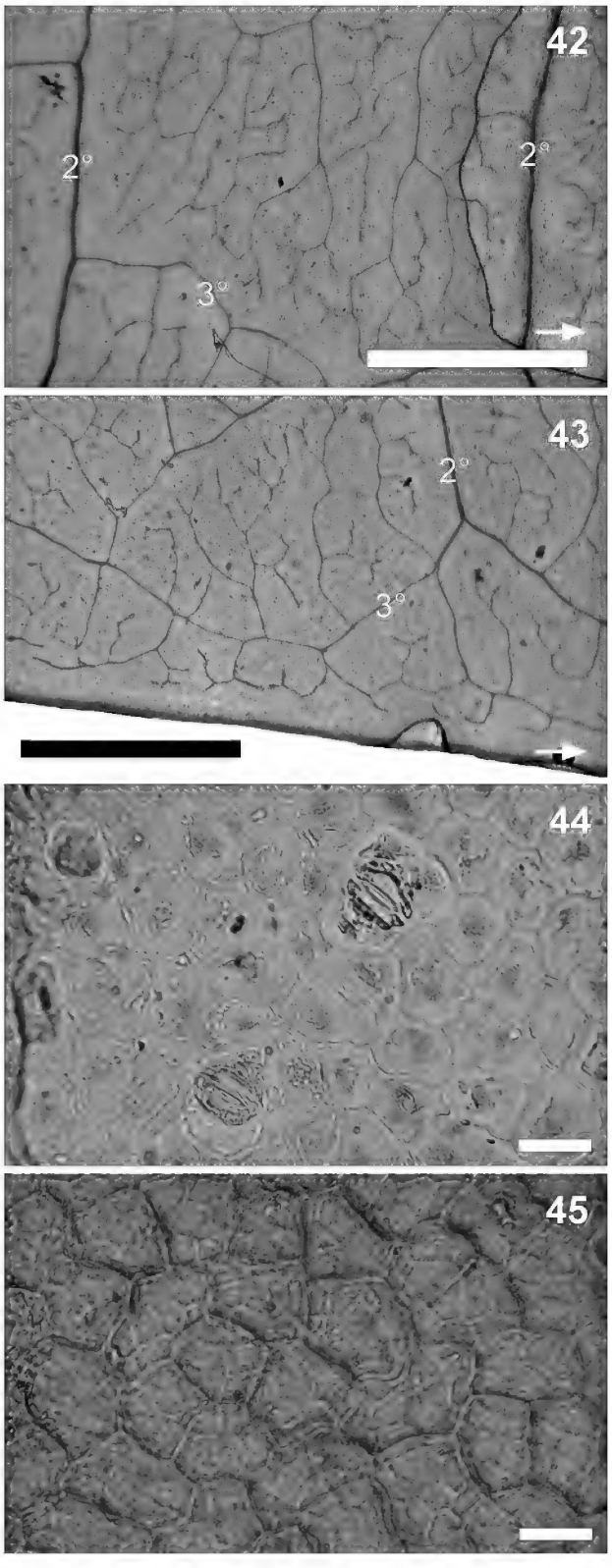

**Figs. 21–27.** *Viburnum tinus* ssp. *rigidum*. – **21**. Cleared leaf [34]. **22**. Secondary to fifth-order veins, freely ending ultimate veinlets dichotomizing [34]. **23**. Ultimate marginal venation, complete loops [34]. **24**. Adaxial cuticle, multicellular trichome base [20]. **25**. Abaxial cuticle [33]. **26**. Adaxial cuticle [34]. **27**. Abaxial cuticle, simple trichome base, part of multicellular trichome [33]. – Scales: 1 cm (21), 1 mm (22–23), 25 µm (24–27).

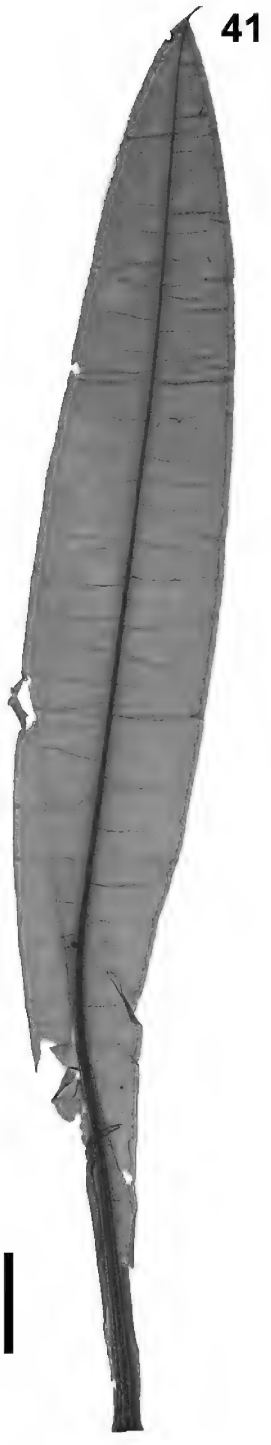



**Figs. 28–33.** *Maytenus canariensis*. – **28**. Cleared leaf [STU 5336]. **29**. Secondary to fifth-order veins, freely ending ultimate veinlets dichotomizing [STU 5336]. **30**. Ultimate marginal venation, incomplete loops [STU 5336]. **31**. Margin [STU 5336]. **32**. Abaxial cuticle [STU 5336]. **33**. Adaxial cuticle [STU 5336]. – Scales: 1 cm (28), 1 mm (29–30), 25 µm (31–33).

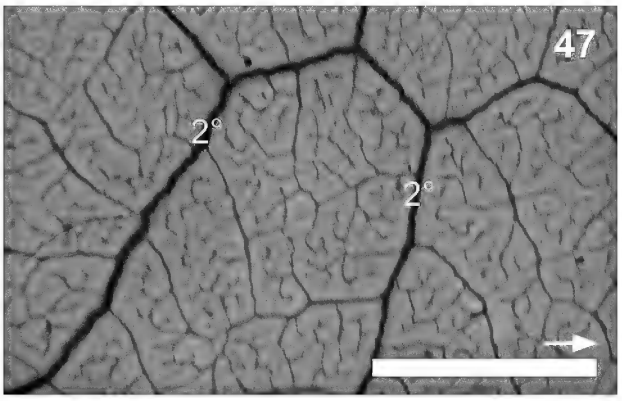


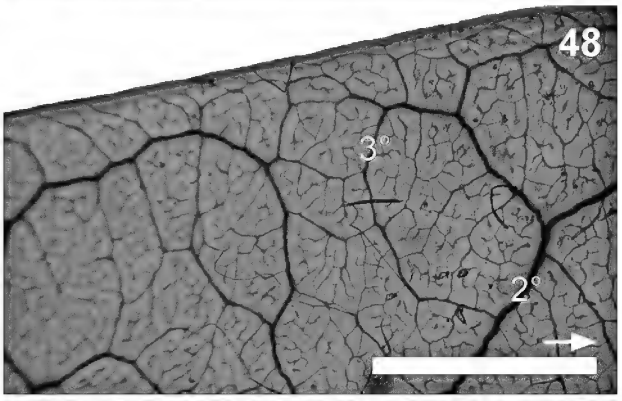

**Figs. 34–40.** *Arbutus canariensis*. – **34**. Cleared leaf [28]. **35**. Secondary to fifth-order veins, freely ending ultimate veinlets dichotomizing [28]. **36**. Ultimate marginal venation, incomplete loops, tooth [28]. **37**. Margin [29]. **38**. Abaxial cuticle [29]. **39**. Adaxial cuticle, trichome, trichome base [29]. **40**. Abaxial cuticle, giant stoma [29]. – Scales: 1 cm (34), 1 mm (35–36), 25 µm (37–40).

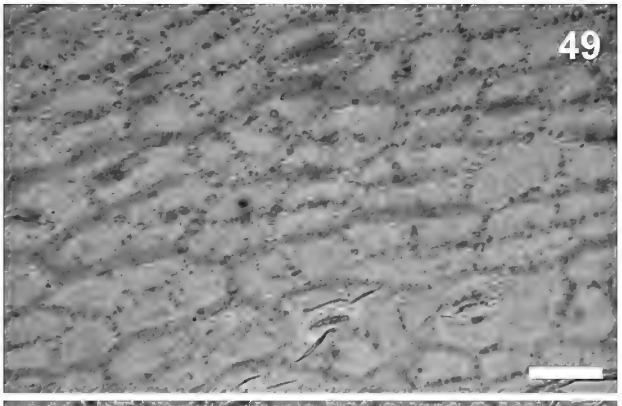


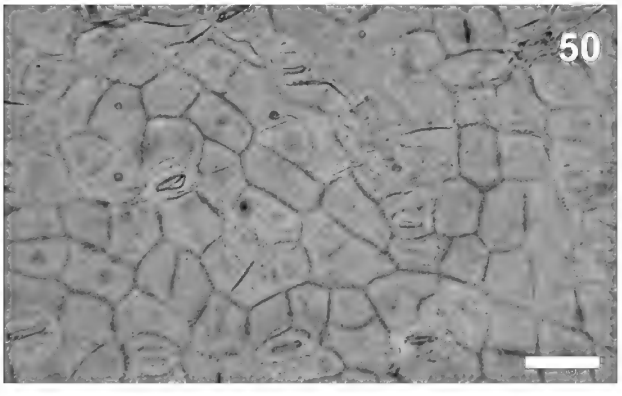



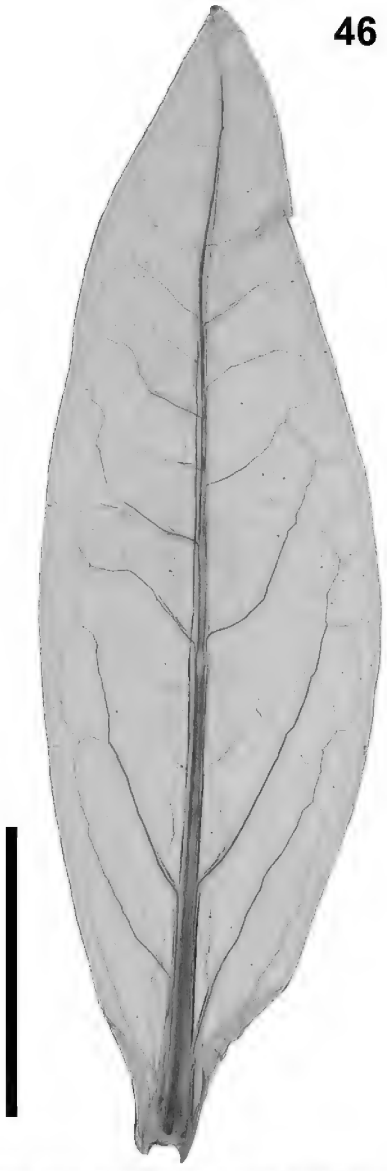

**Figs. 41–45.** *Euphorbia mellifera*. – **41**. Cleared leaf [STU 7179]. **42**. Secondary to fourth-order veins, freely ending ultimate veinlets dichotomizing [STU 7179]. **43**. Ultimate marginal venation, incomplete loops [STU 7179]. **44**. Abaxial cuticle [STU 15070]. **45**. Adaxial cuticle with hypodermis [STU 15070]. – Scales: 1 cm (41), 1 mm (42–43), 25 µm (44–45).

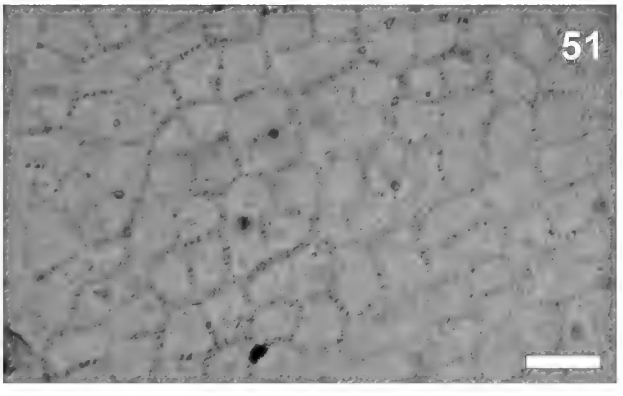


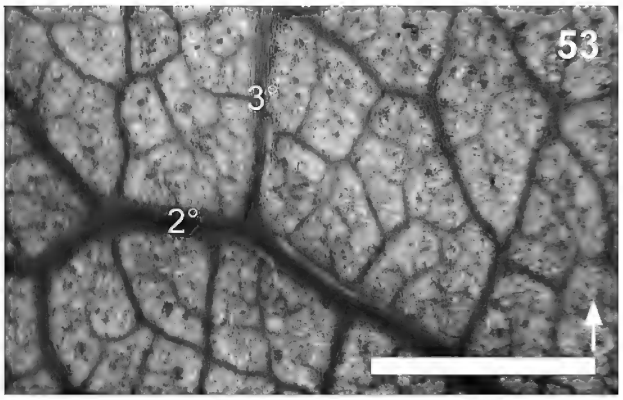



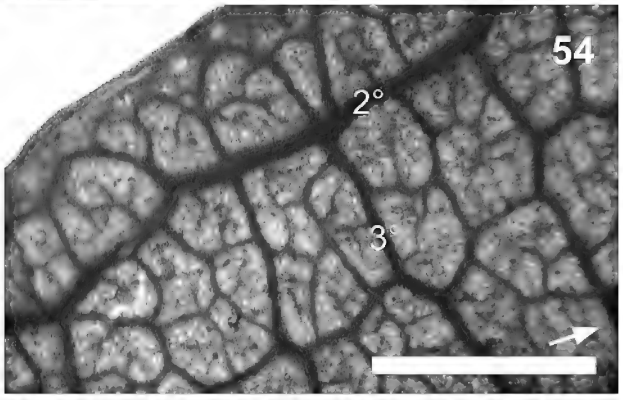



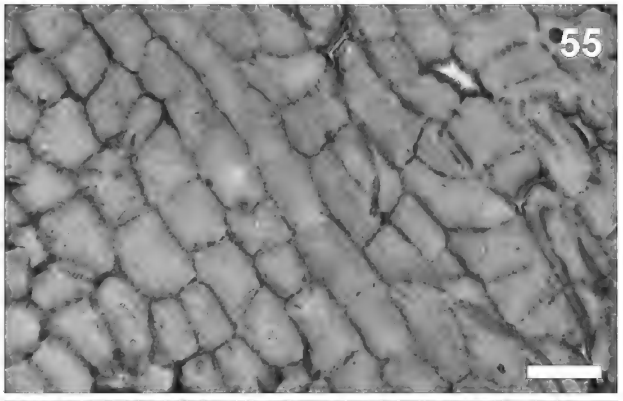



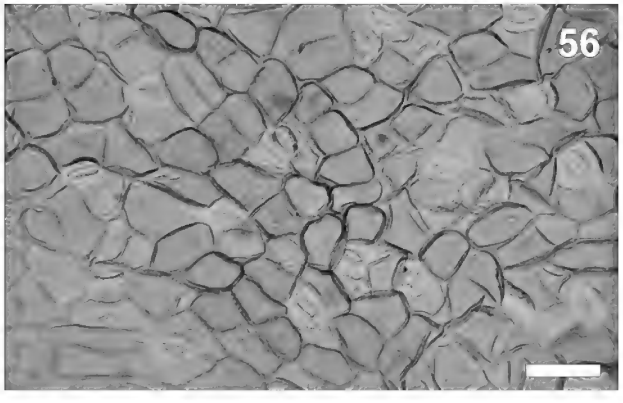



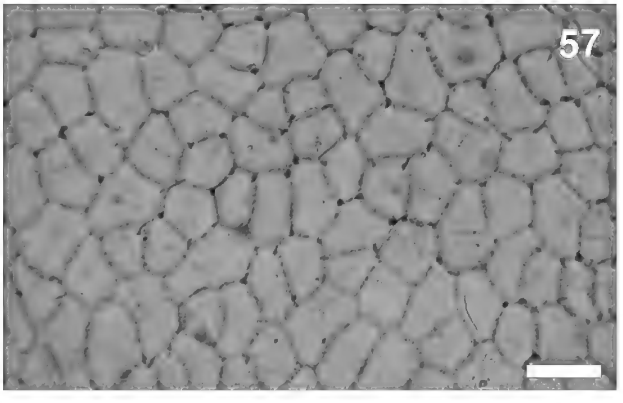

**Figs. 46–51.** *Hypericum canariense*. – **46**. Cleared leaf [21]. **47**. Secondary to fourth-order veins, freely ending ultimate veinlets dichotomizing [21]. **48**. Ultimate marginal venation, incomplete loops [21]. **49**. Margin [21]. **50**. Abaxial cuticle [21]. **51**. Adaxial cuticle [21]. – Scales: 1 cm (46), 1 mm (47–48), 25 µm (49–51).



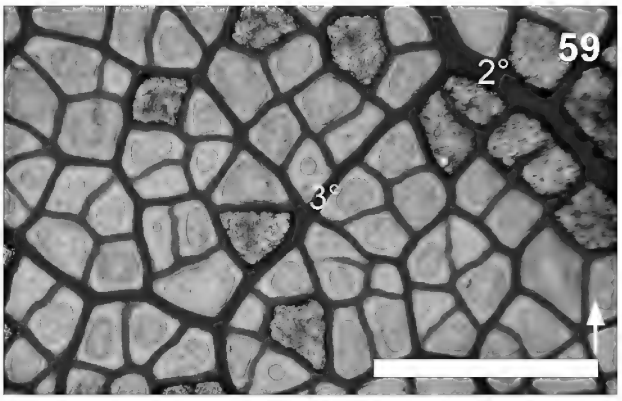



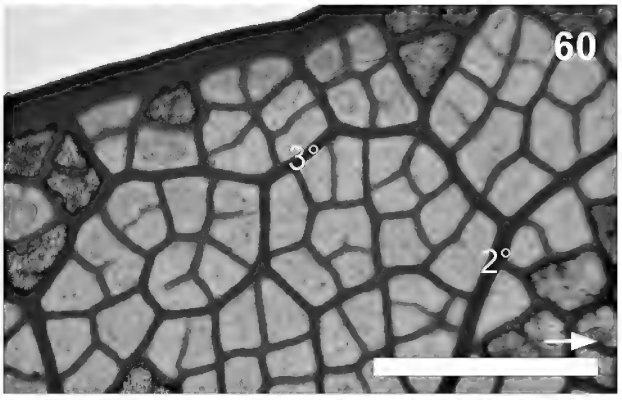



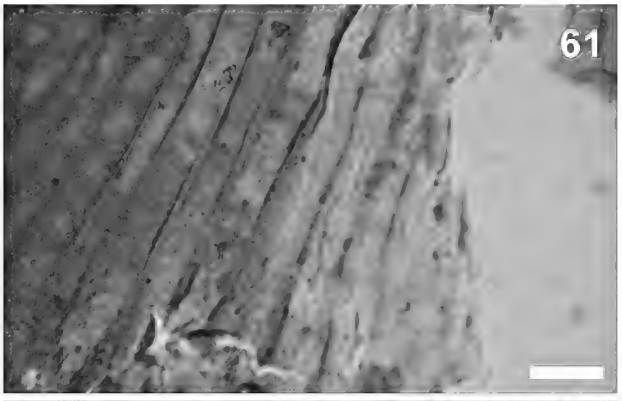



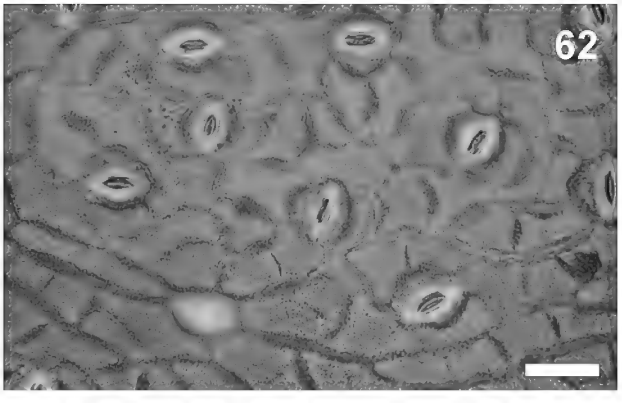



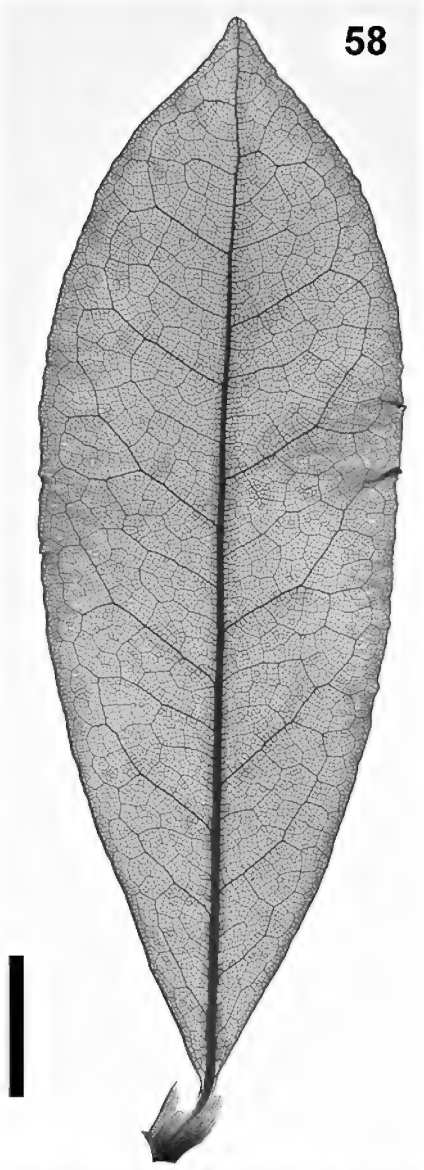
**Figs. 52–57.** *Hypericum grandifolium*. – **52**. Cleared leaf [6]. **53**. Secondary to fifth-order veins, freely ending ultimate veinlets dichotomizing or forming polygons [6]. **54**. Ultimate marginal venation, complete loops [6]. **55**. Margin [6]. **56**. Abaxial cuticle [6]. **57**. Adaxial cuticle [6]. – Scales: 1 cm (52), 1 mm (53–54), 25 µm (55–57).

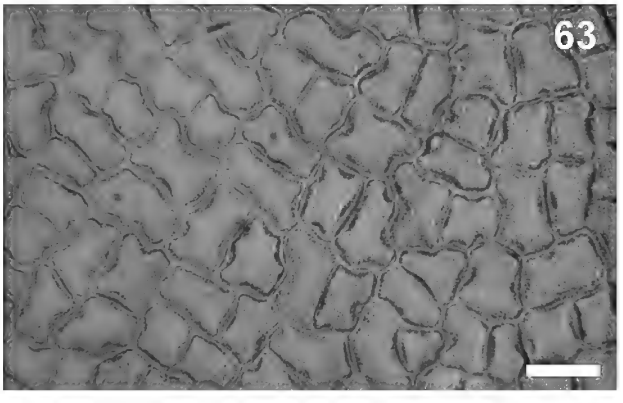


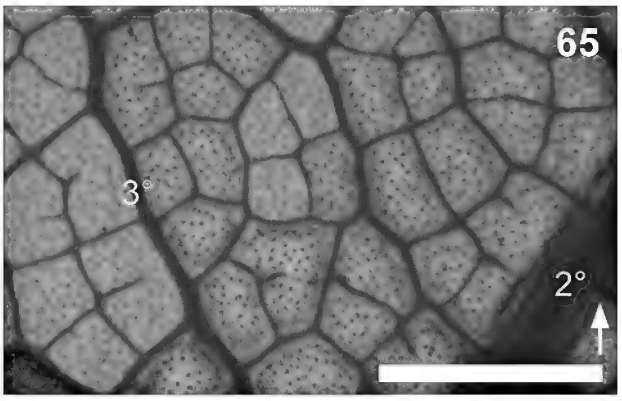



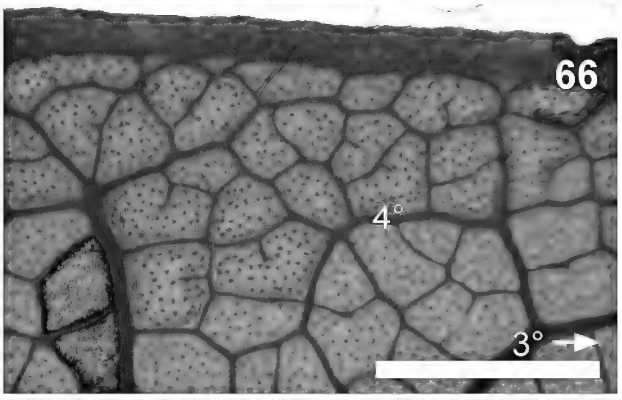



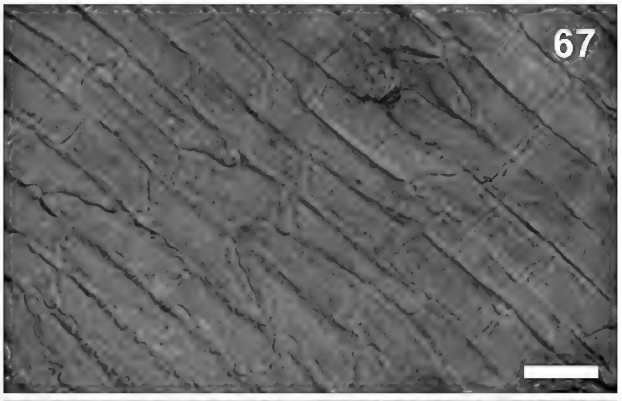



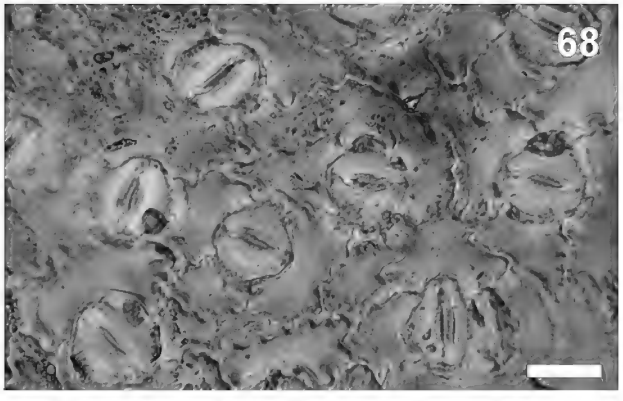



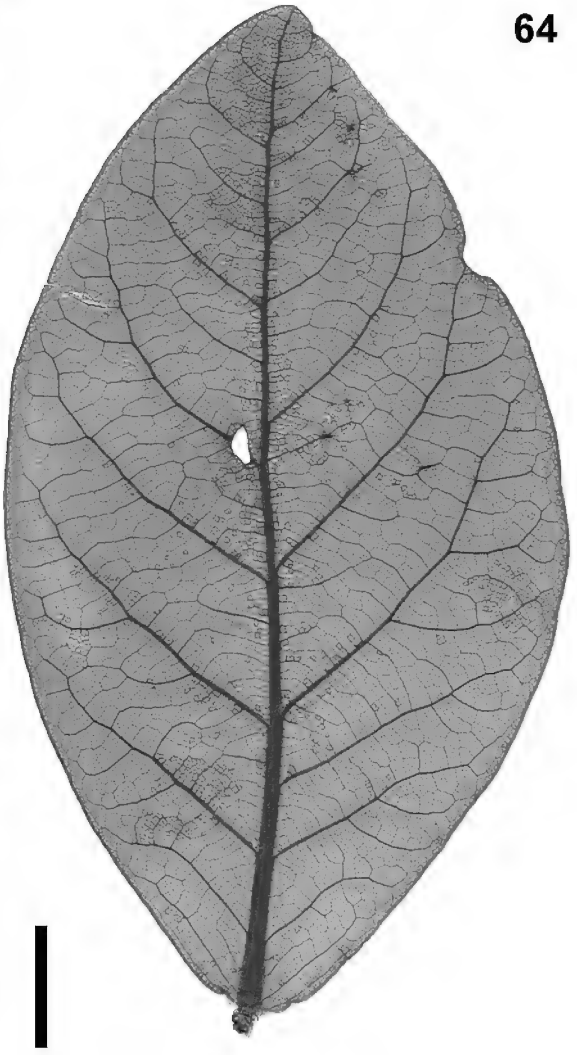

**Figs. 58–63.** *Apollonias barbujana*. – **58**. Cleared leaf [17]. **59**. Secondary to fourth-order veins, freely ending ultimate veinlets forming polygons [17]. **60**. Ultimate marginal venation, fimbrial vein [17]. **61**. Margin [45]. **62**. Abaxial cuticle, secretory body [5]. **63**. Adaxial cuticle [5]. – Scales: 1 cm (58), 1 mm (59–60), 25 µm (61–63).

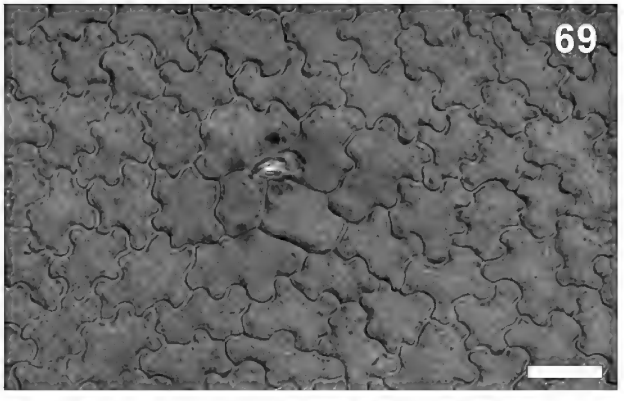


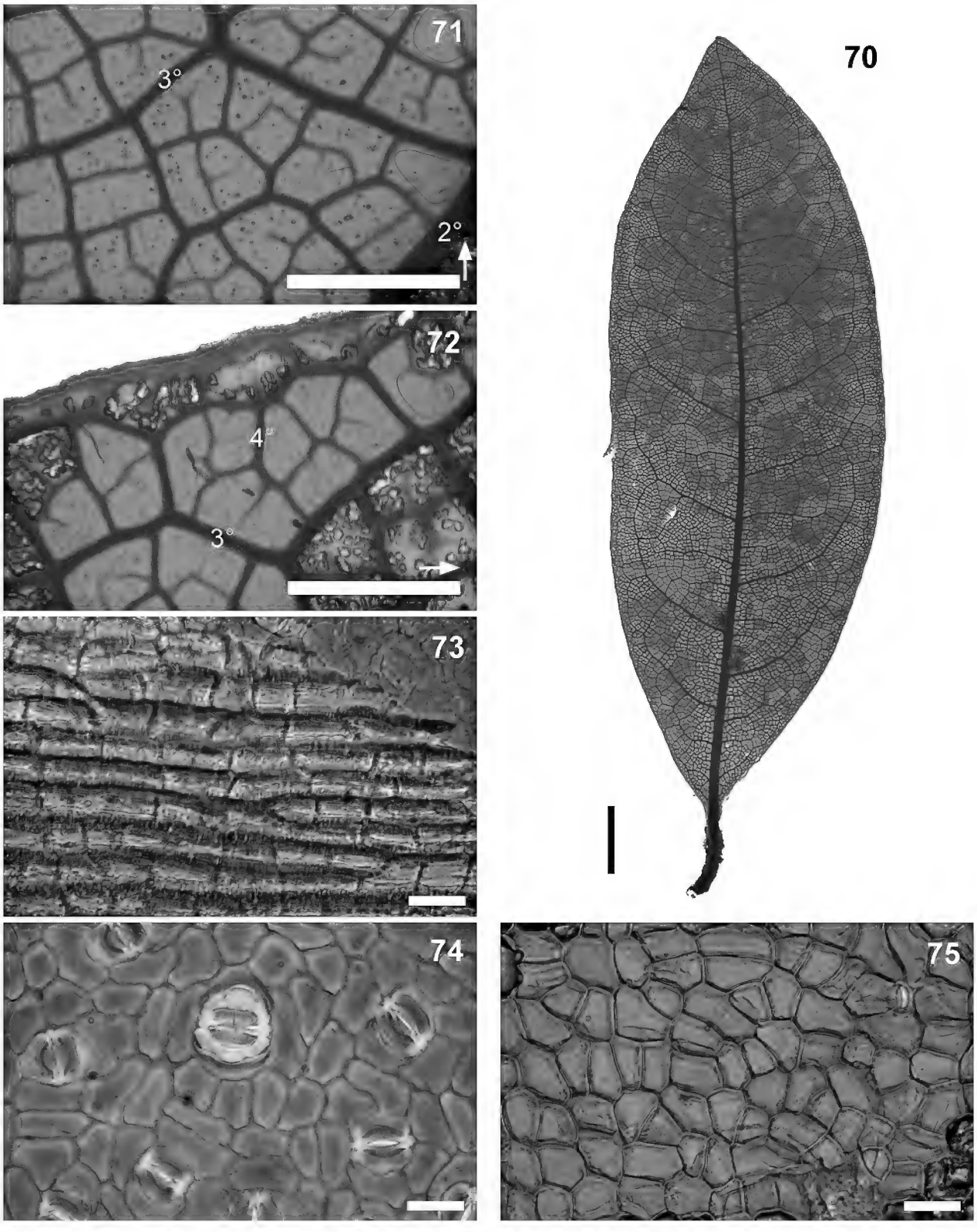



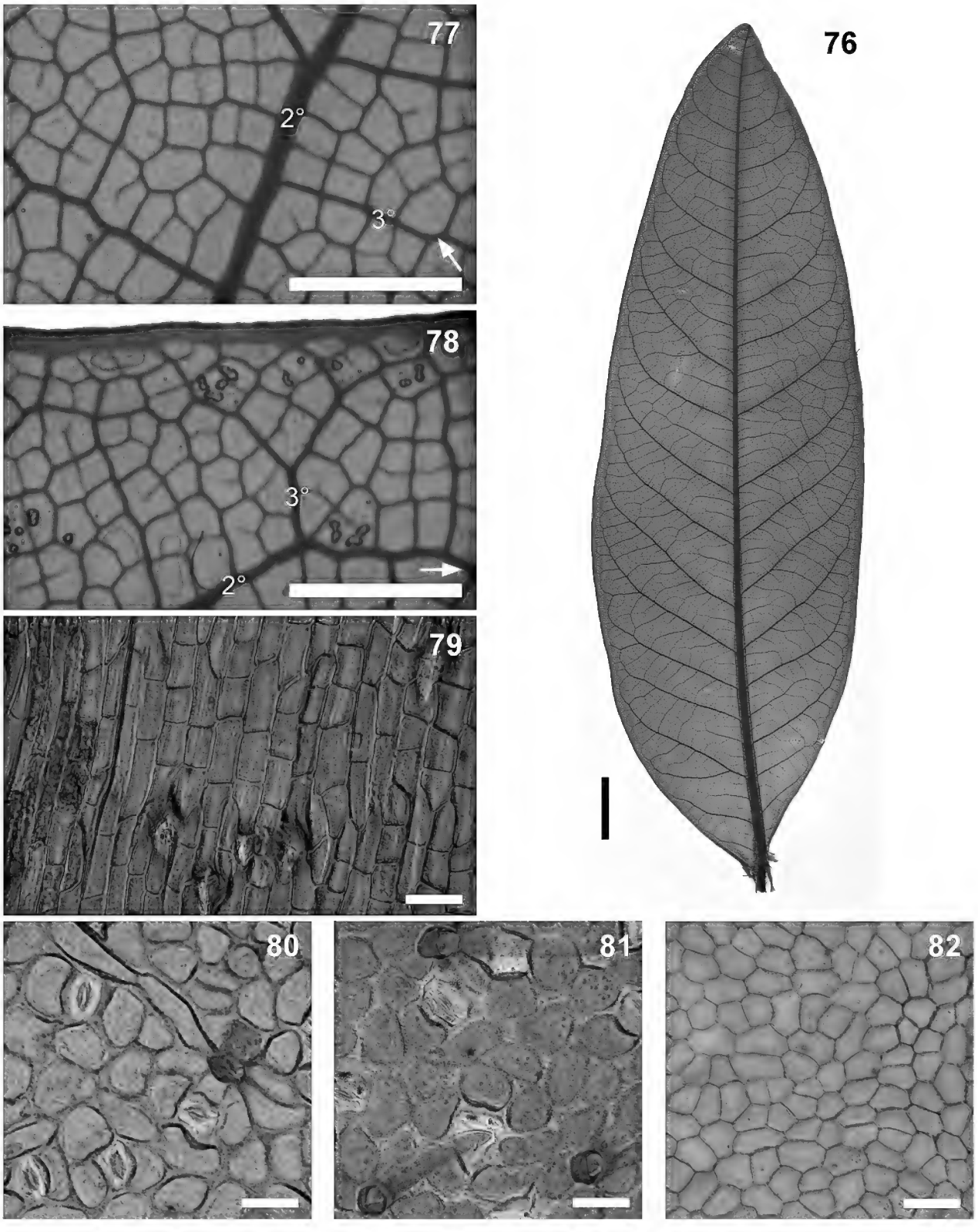



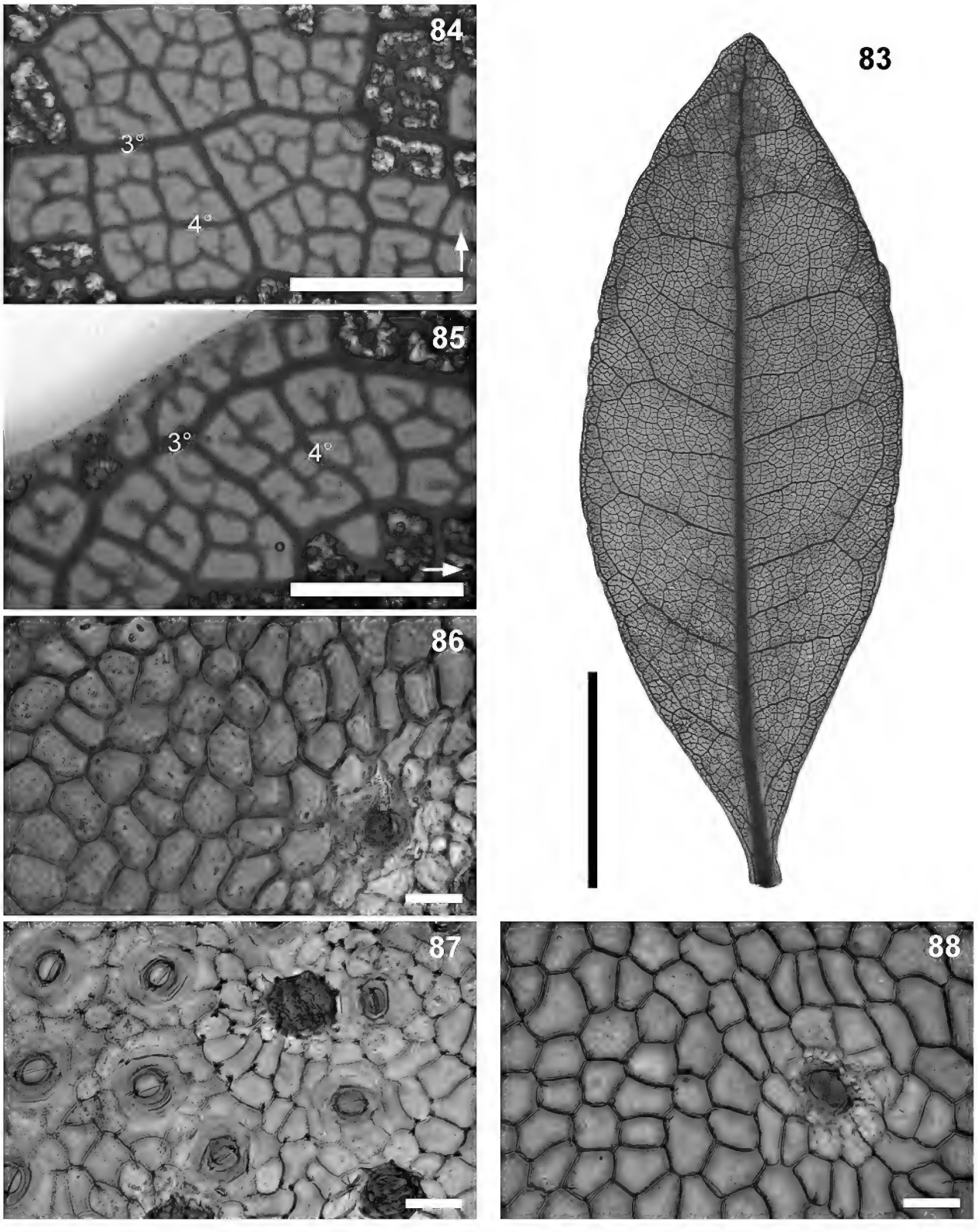

**Figs. 64–69.** *Laurus azorica*. – **64**. Cleared leaf [38]. **65**. Secondary to fifth-order veins, freely ending ultimate veinlets forming polygons, secretory bodies [38]. **66**. Ultimate marginal venation, fimbrial vein [38]. **67**. Margin [11]. **68**. Abaxial cuticle [4]. **69**. Adaxial cuticle [55]. – Scales: 1 cm (64), 1 mm (65–66), 25 µm (67–69).



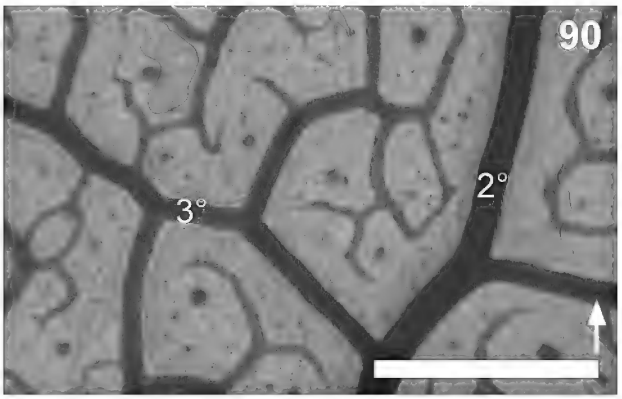

**Figs. 70–75.** *Ocotea foetens*. – **70**. Cleared leaf [47]. **71**. Secondary to fifth-order veins, freely ending ultimate veinlets dichotomizing or forming polygons, secretory bodies [47]. **72**. Ultimate marginal venation, complete loops [47]. **73**. Margin [47]. **74**. Abaxial cuticle [47]. **75**. Adaxial cuticle [47]. – Scales: 1 cm (70), 1 mm (71–72), 25 µm (73–75).

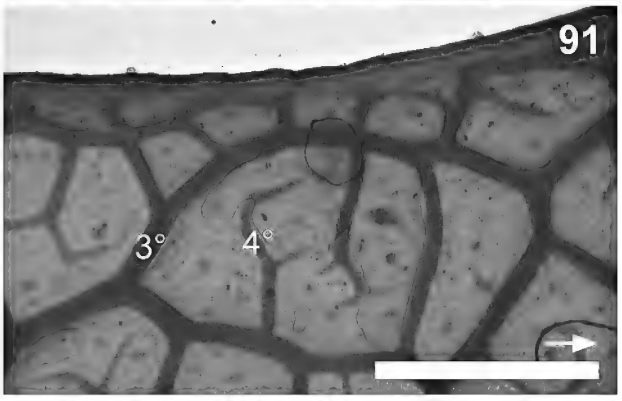


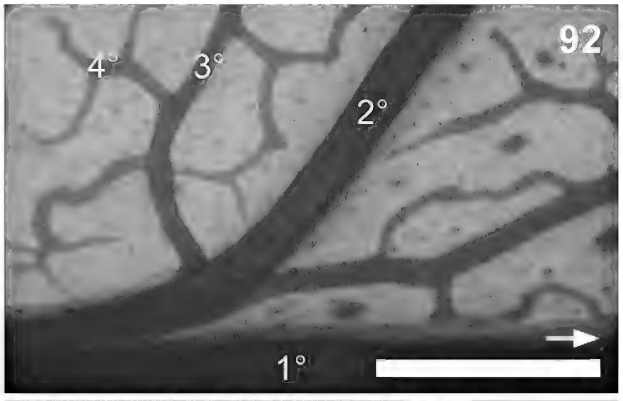

**Figs. 76–82.** *Persea indica*. – **76**. Cleared leaf [16]. **77**. Secondary to fifth-order veins, freely ending ultimate veinlets forming polygons [16]. **78**. Ultimate marginal venation, complete loops [16]. **79**. Margin [44]. **80**. Abaxial cuticle [44]. **81**. Abaxial cuticle [16]. **82**. Adaxial cuticle [16]. – Scales: 1 cm (76), 1 mm (77–78), 25 µm (79–82).

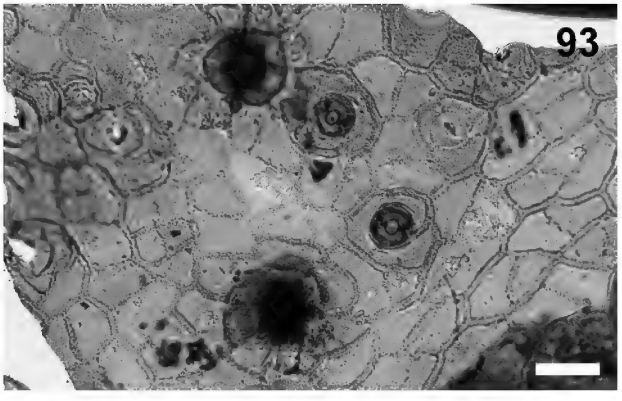


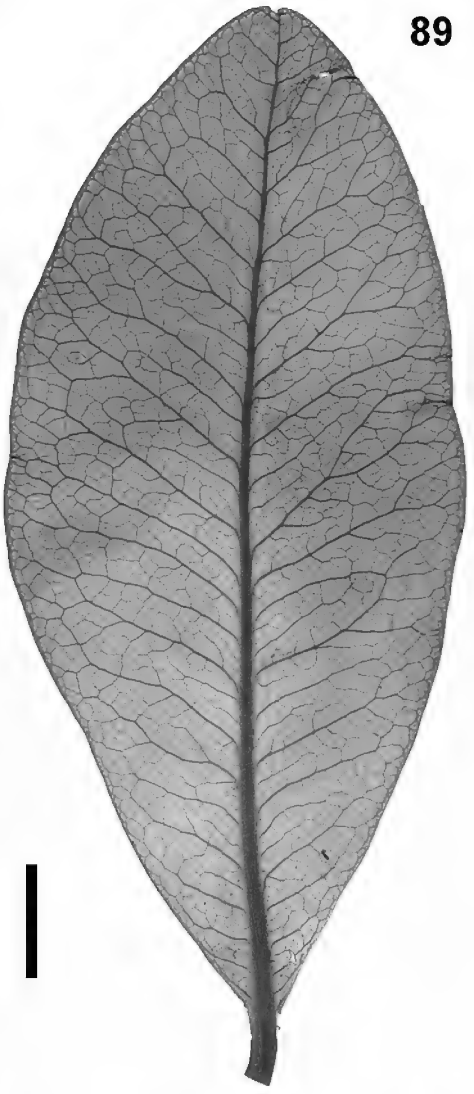

**Figs. 83–88.** *Myrica faya*. – **83**. Cleared leaf [51]. **84**. Tertiary to fifth-order veins, freely ending ultimate veinlets dichotomizing [51]. **85**. Ultimate marginal venation, complete loops [51]. **86**. Margin [22]. **87**. Abaxial cuticle [36]. **88**. Adaxial cuticle [22]. – Scales: 1 cm (83), 1 mm (84–85), 25 µm (86–88).

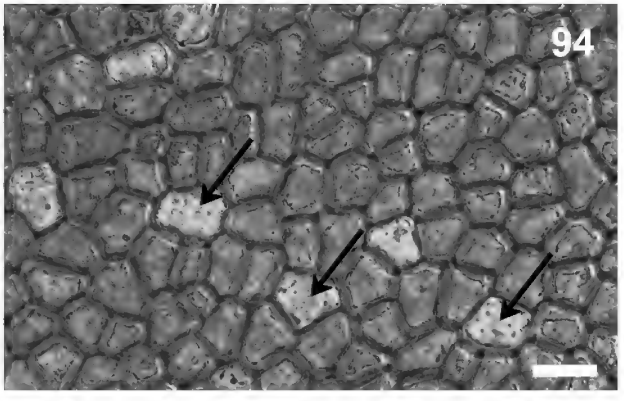


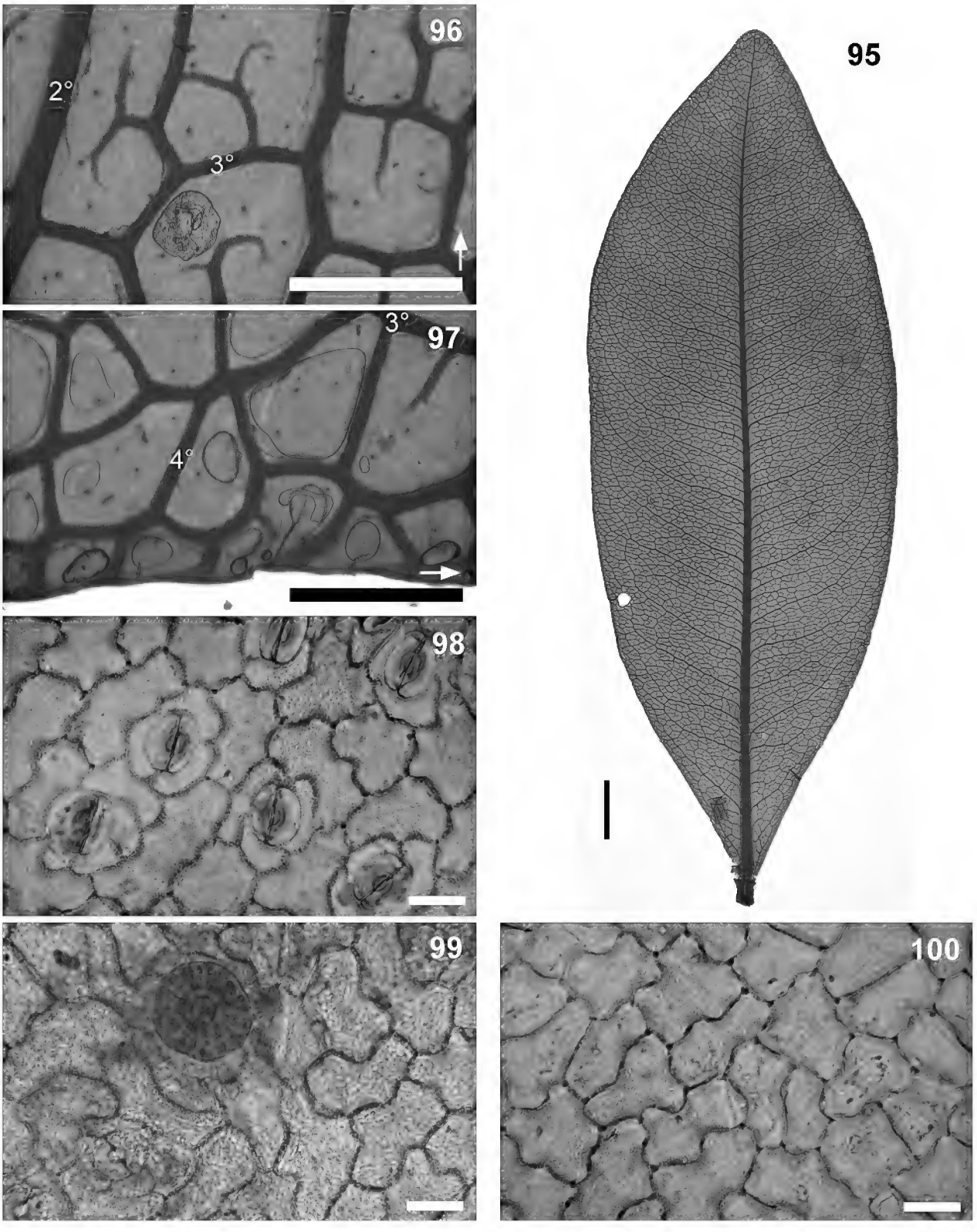



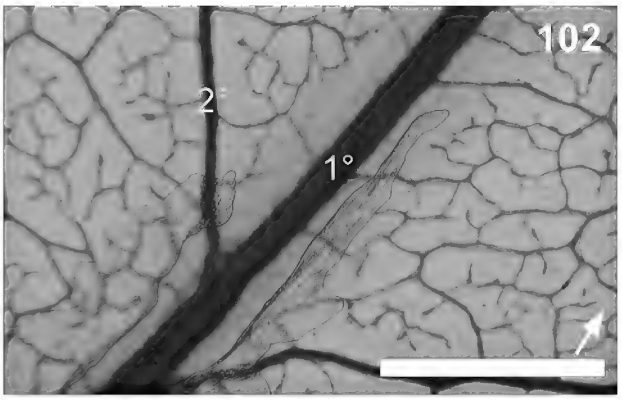



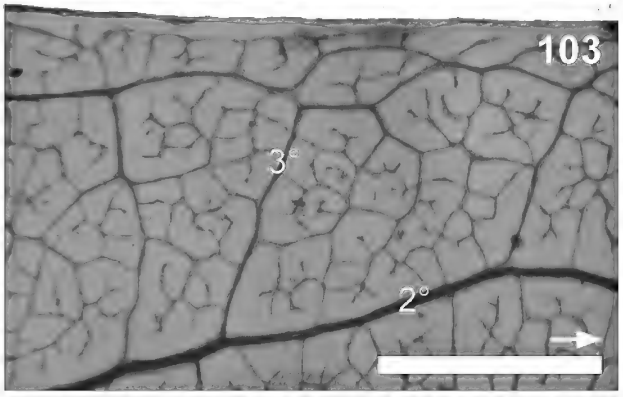



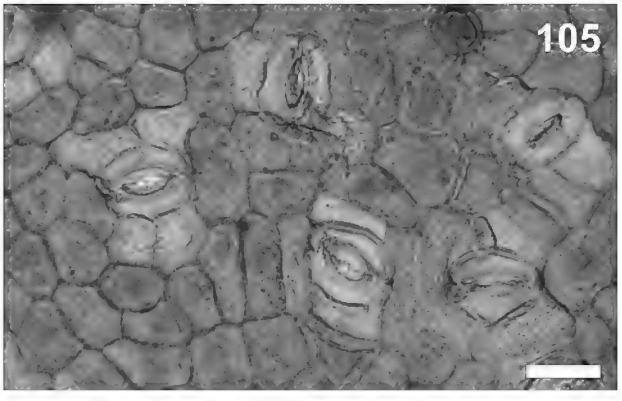

**Figs. 89–94.** *Heberdenia excelsa*. – **89**. Cleared leaf [STU 9258]. **90**. Secondary to fourth-order veins, freely ending ultimate veinlets dichotomizing [STU 9258]. **91**. Ultimate marginal venation, incomplete to complete loops [STU 9258]. **92**. Primary vein [STU 9258]. **93**. Abaxial cuticle, peltate trichomes [STU 7559]. **94**. Adaxial cuticle, bigger cells (see arrows) scattered [STU 7559]. – Scales: 1 cm (89), 1 mm (90–92), 25 µm (93–94).

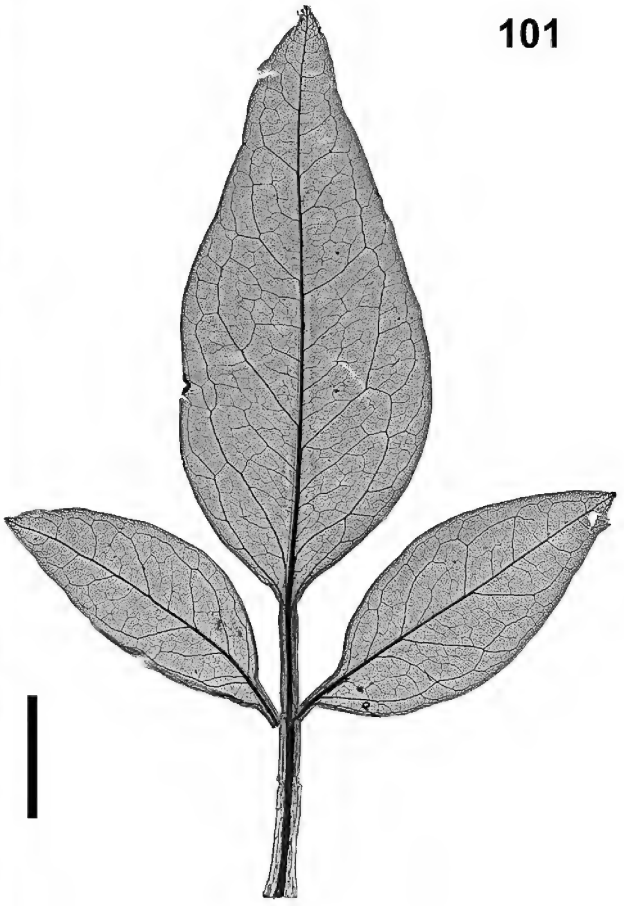


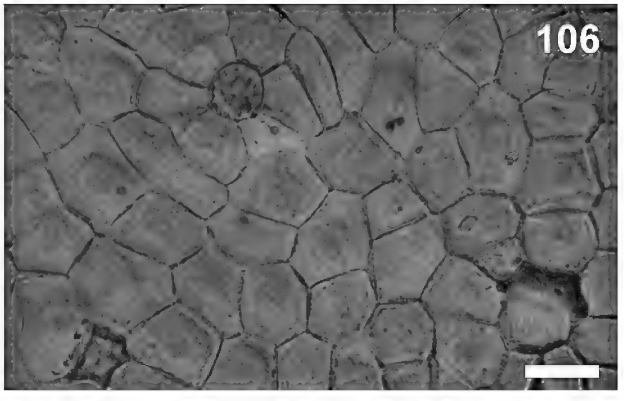

**Figs. 95–100.** *Pleiomeris canariensis*. – **95**. Cleared leaf [STU 8665]. **96**. Secondary to fourth-order veins, freely ending ultimate veinlets dichotomizing or forming polygons [STU 8665]. **97**. Ultimate marginal venation, complete loops [STU 8665]. **98**. Abaxial cuticle [STU 8665]. **99**. Abaxial cuticle, multicellular trichome [STU 8665]. **100**. Adaxial cuticle [STU 8665]. – Scales: 1 cm (95), 1 mm (96–97), 25 µm (98–100).



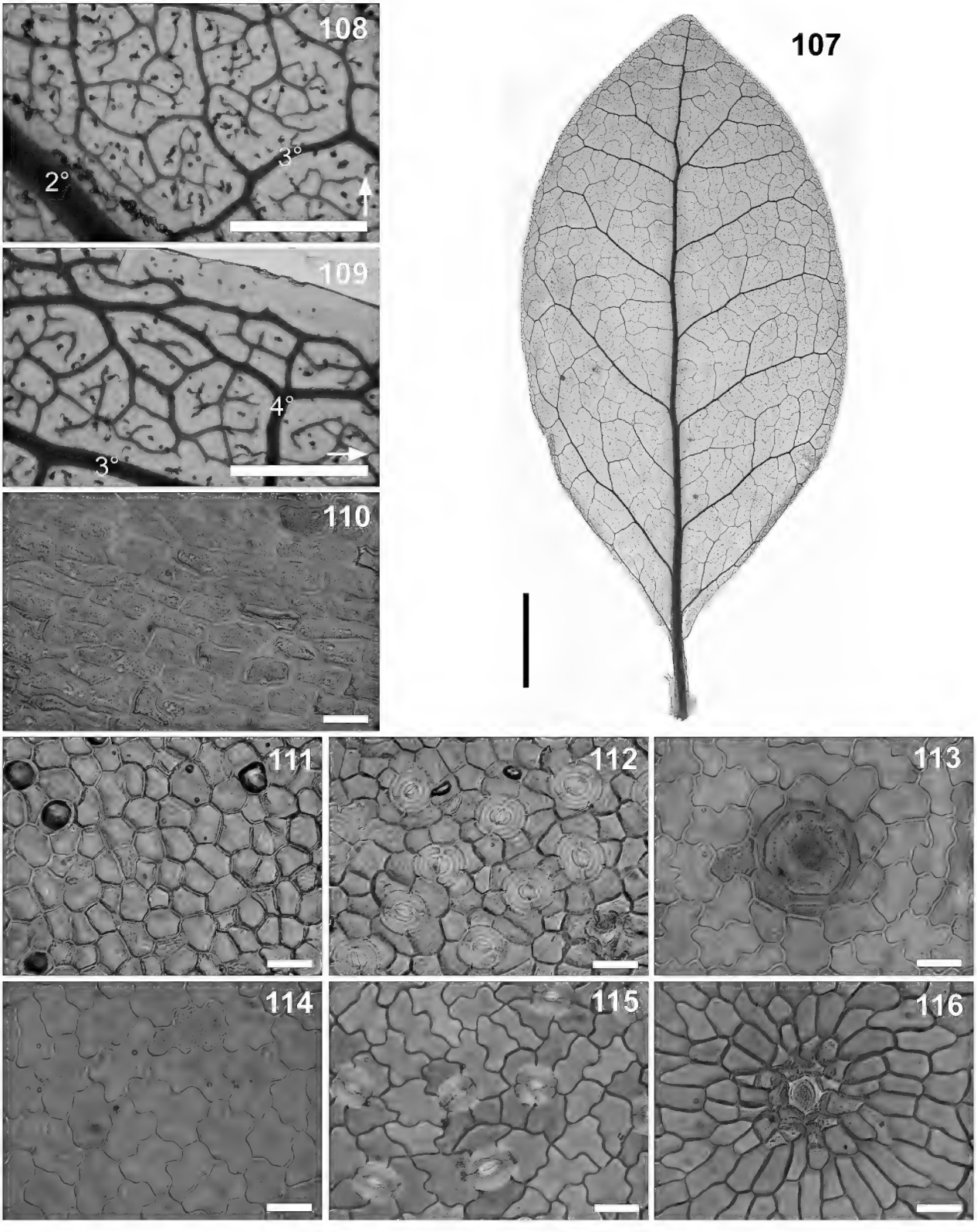





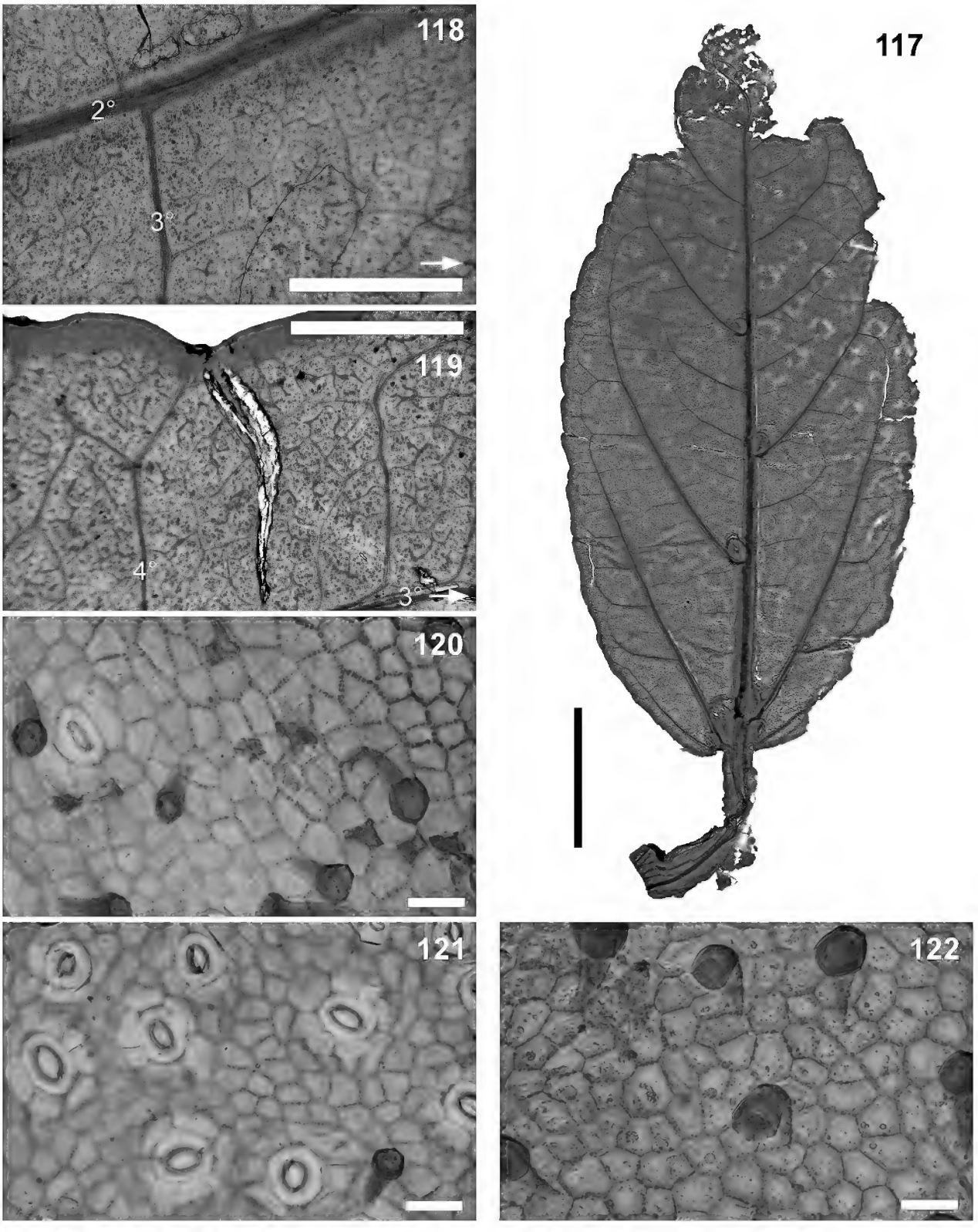



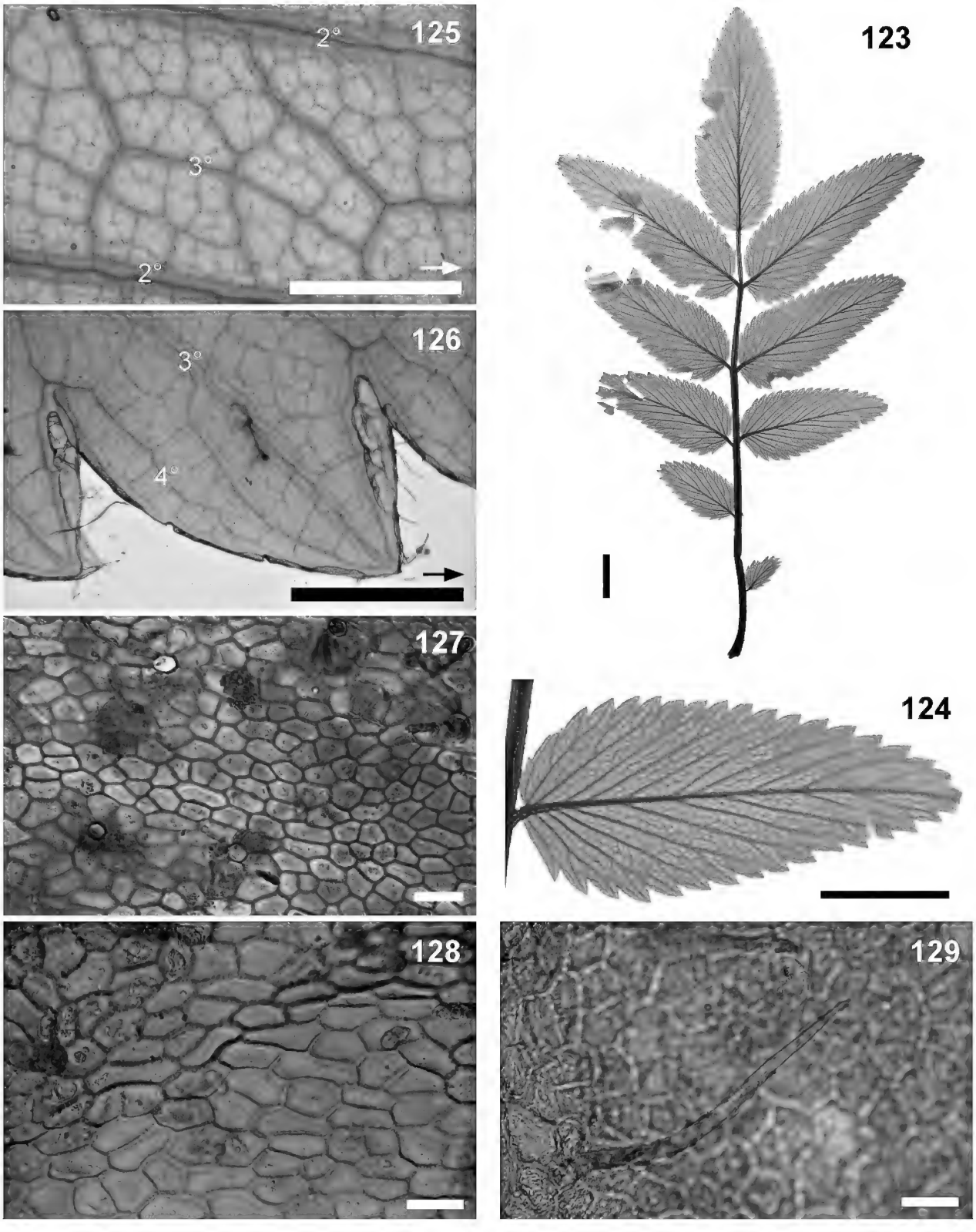

**Figs. 101–106.** *Jasminum odoratissimum*. – **101**. Cleared leaf [27]. **102**. Secondary to fourth-order veins, freely ending ultimate veinlets dichotomizing [27]. **103**. Ultimate marginal venation, complete or incomplete loops [27]. **104**. Margin [27]. **105**. Abaxial cuticle [27]. **106**. Adaxial cuticle [27]. – Scales: 1 cm (101), 1 mm (102–103), 25 µm (104–106).



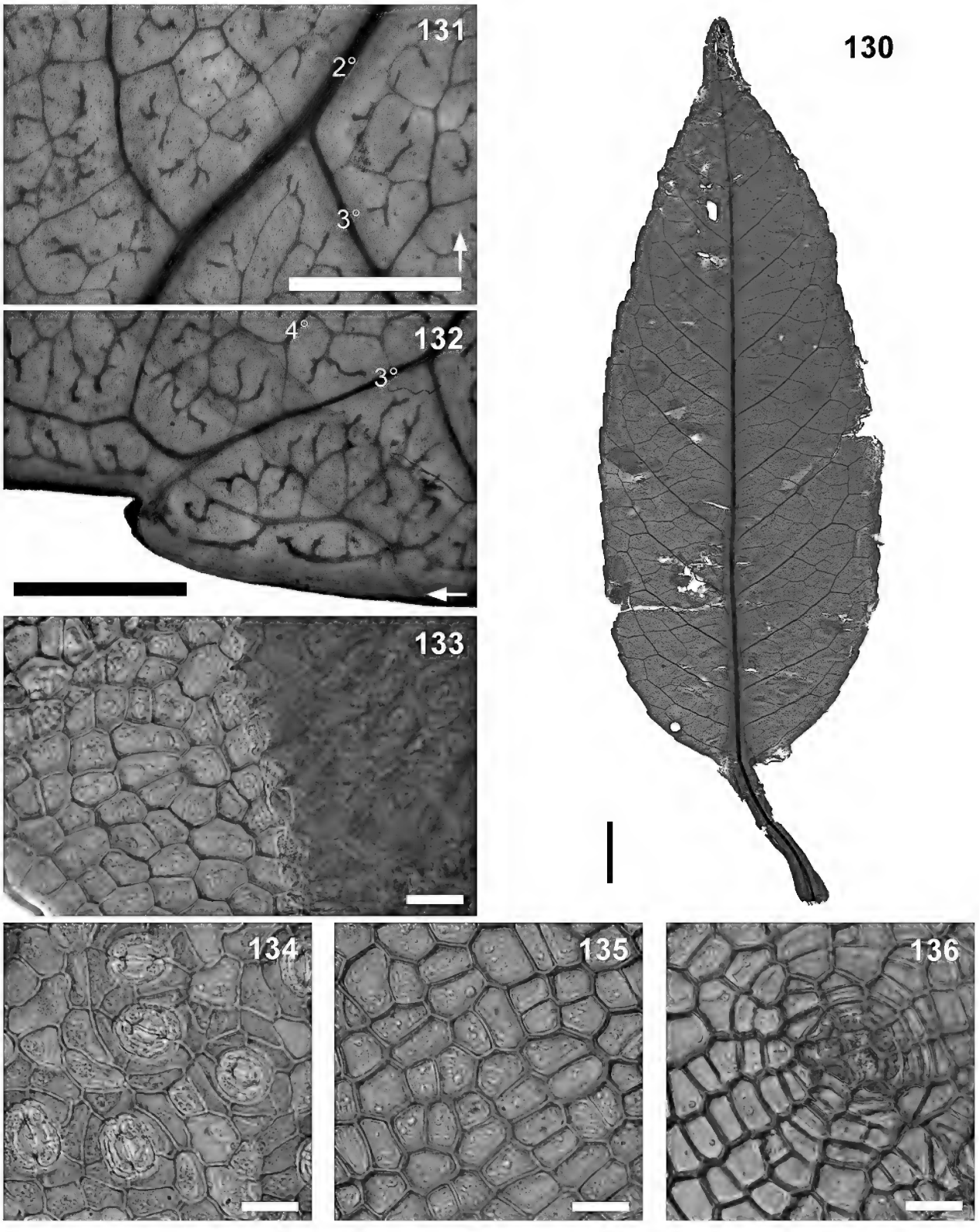

**Figs. 107–116.** *Picconia excelsa*. – **107**. Cleared leaf [24]. **108**. Secondary to fifth-order veins, freely ending ultimate veinlets dichotomizing [24]. **109**. Ultimate marginal venation, complete or incomplete loops [24]. **110**. Margin [42]. **111**. Adaxial cuticle, straight anticlines [40]. **112**. Abaxial cuticle [40]. **113**. Abaxial cuticle, glandular peltate trichome [43]. **114**. Adaxial cuticle, undulate anticlines [43]. **115**. Abaxial cuticle [43]. **116**. Abaxial cuticle, gland [43]. – Scales: 1 cm (107), 1 mm (108–109), 25 µm (110–116).



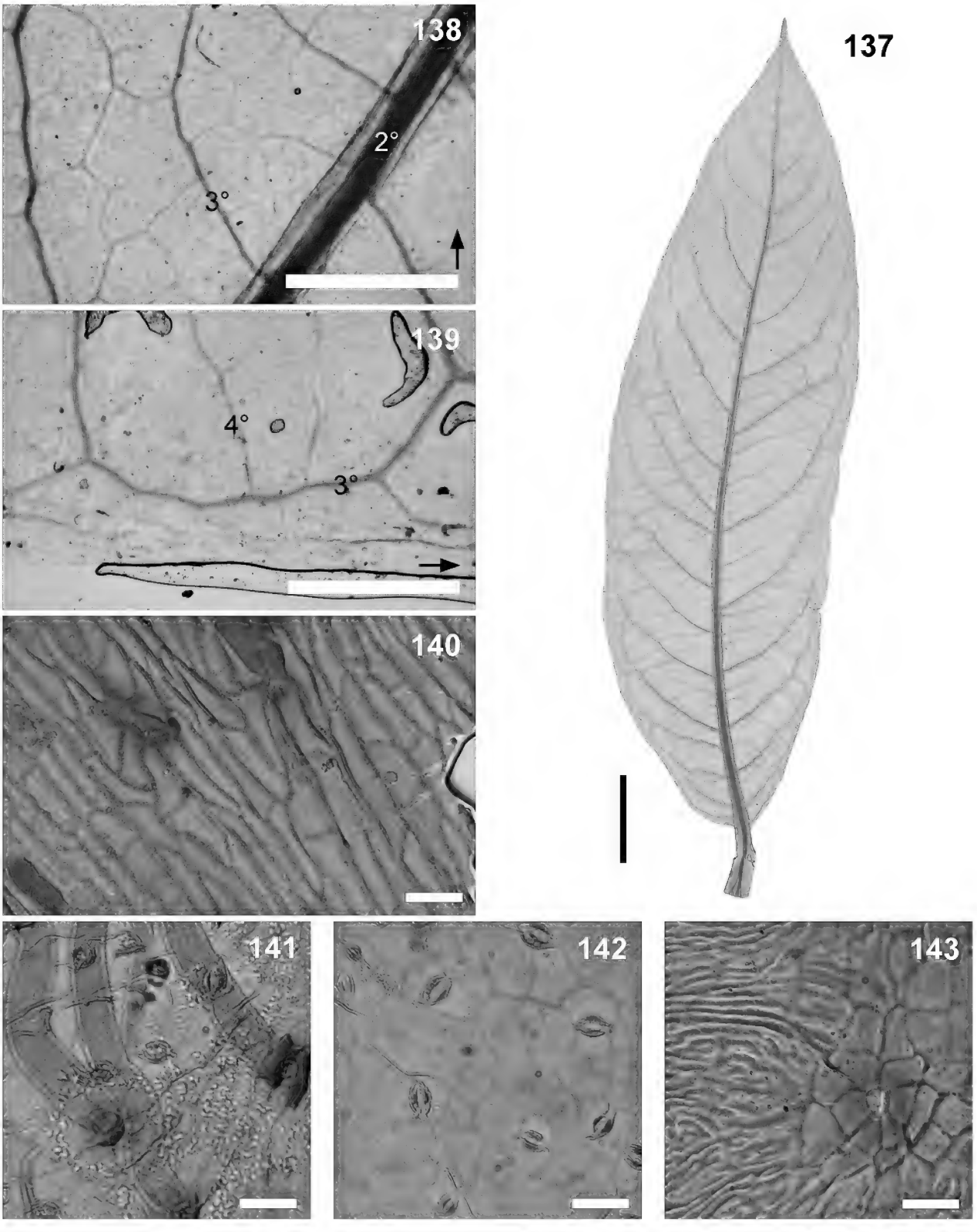

**Figs. 117–122.** *Rhamnus glandulosa*. – **117**. Cleared leaf [3]. **118**. Secondary to fifth-order veins, freely ending ultimate veinlets dichotomizing [3]. **119**. Ultimate marginal venation, complete loops, tooth [3]. **120**. Margin [9]. **121**. Abaxial cuticle [9]. **122**. Adaxial cuticle [3]. – Scales: 1 cm (117), 1 mm (118–119), 25 µm (120–122).



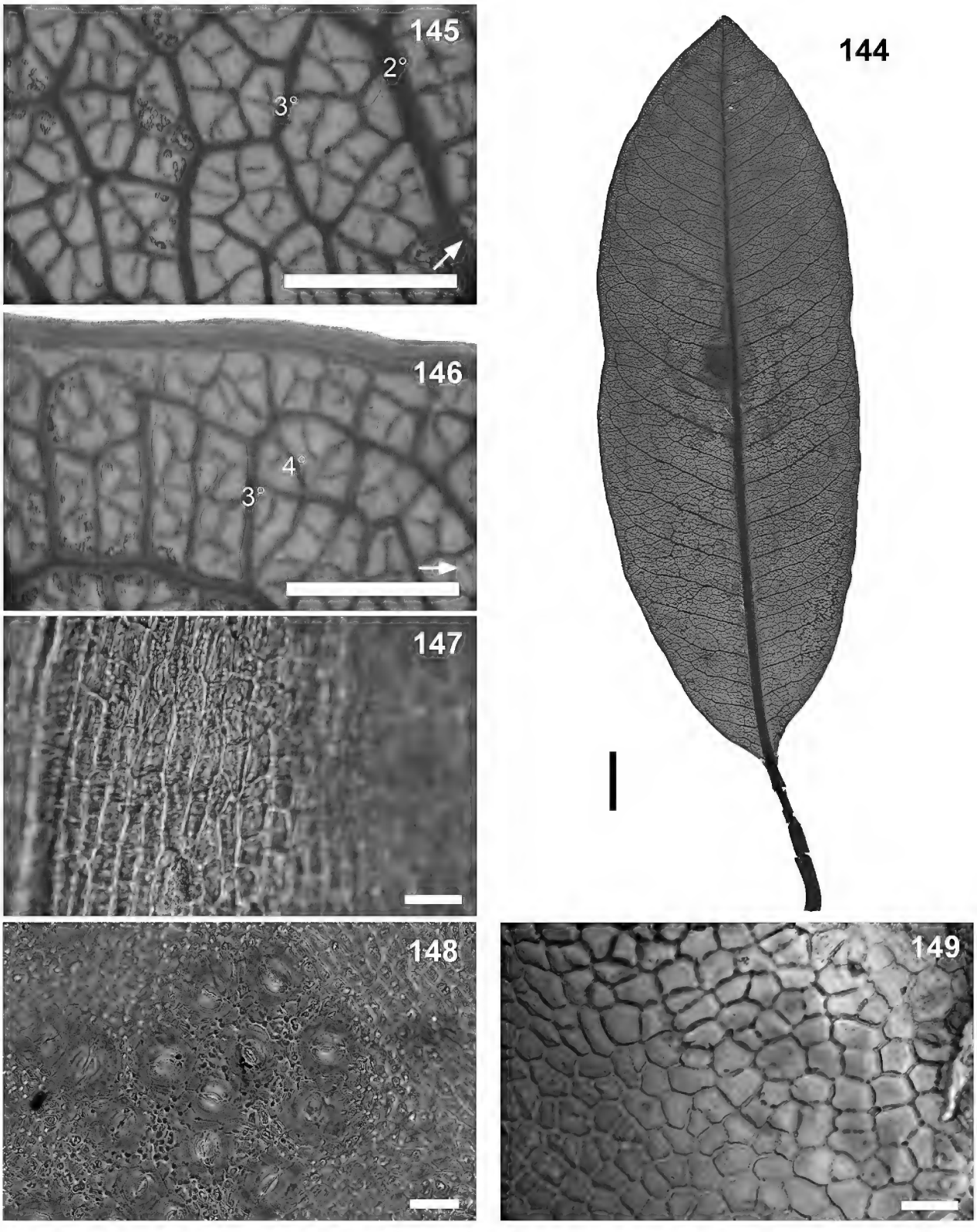

**Figs. 123–129.** *Bencomia caudata*. – **123**. Cleared leaf [STU 5352]. **124**. Cleared leaflet [STU 5352]. **125**. Secondary to sixth-order veins, freely ending ultimate veinlets dichotomizing [STU 5352]. **126**. Ultimate marginal venation, complete loops, fifth-order veins may protrude, tooth [STU 5352]. **127**. Abaxial cuticle, glandular trichome [STU 5352]. **128**. Adaxial cuticle [STU 8676]. **129**. Adaxial cuticle, trichome [STU 8676]. – Scales: 1 cm (123–124), 1 mm (125–126), 25 µm (127–129).



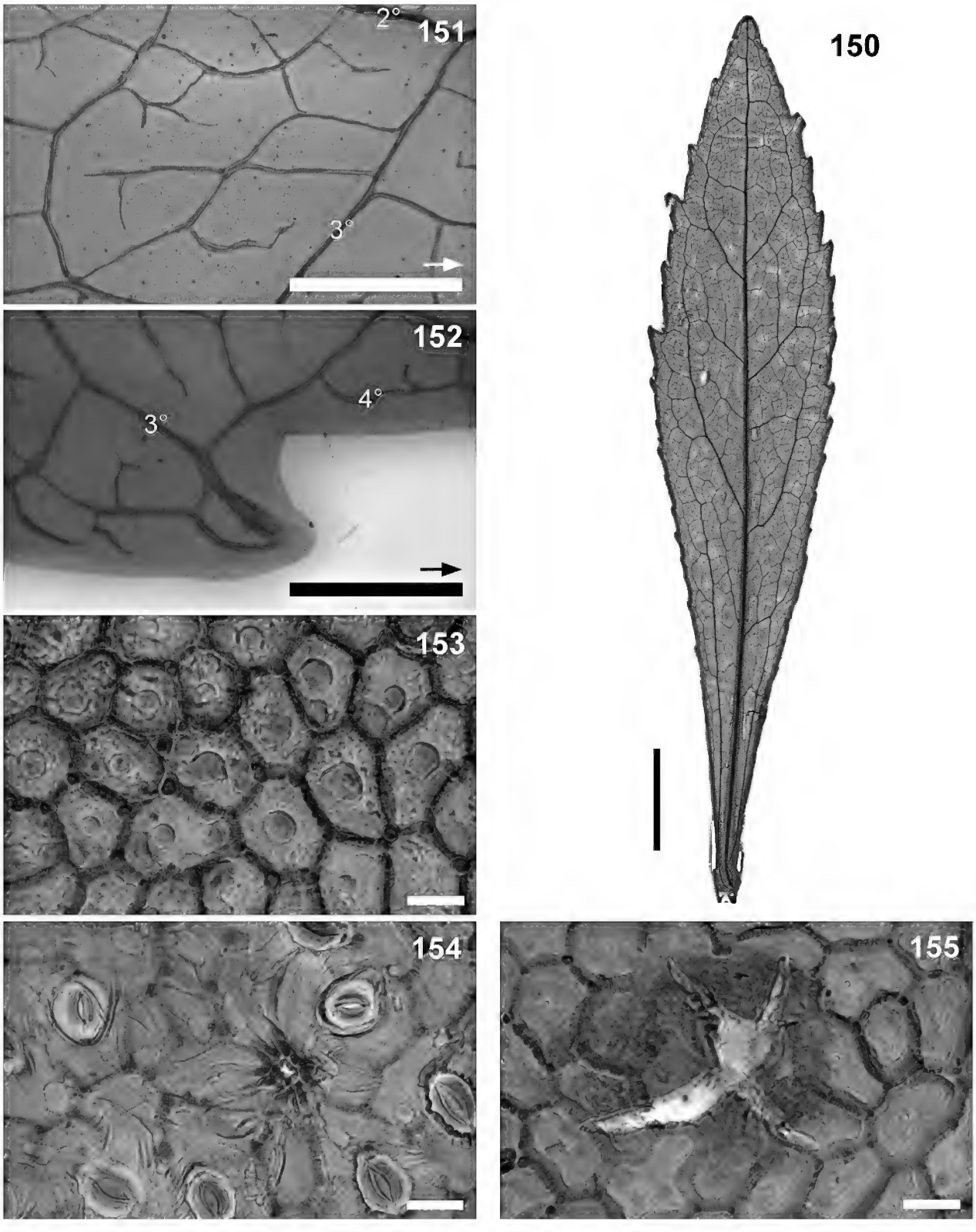

**Figs. 130–136.** *Prunus lusitanica*. – **130**. Cleared leaf [1]. **131**. Secondary to fifth-order veins, freely ending ultimate veinlets dichotomizing [1]. **132**. Ultimate marginal venation, incomplete loops, tooth [1]. **133**. Margin [1]. **134**. Abaxial cuticle [1]. **135**. Adaxial cuticle [1]. **136**. Adaxial cuticle, cork-wart [1]. – Scales: 1 cm (130), 1 mm (131–132), 25 µm (134–136).



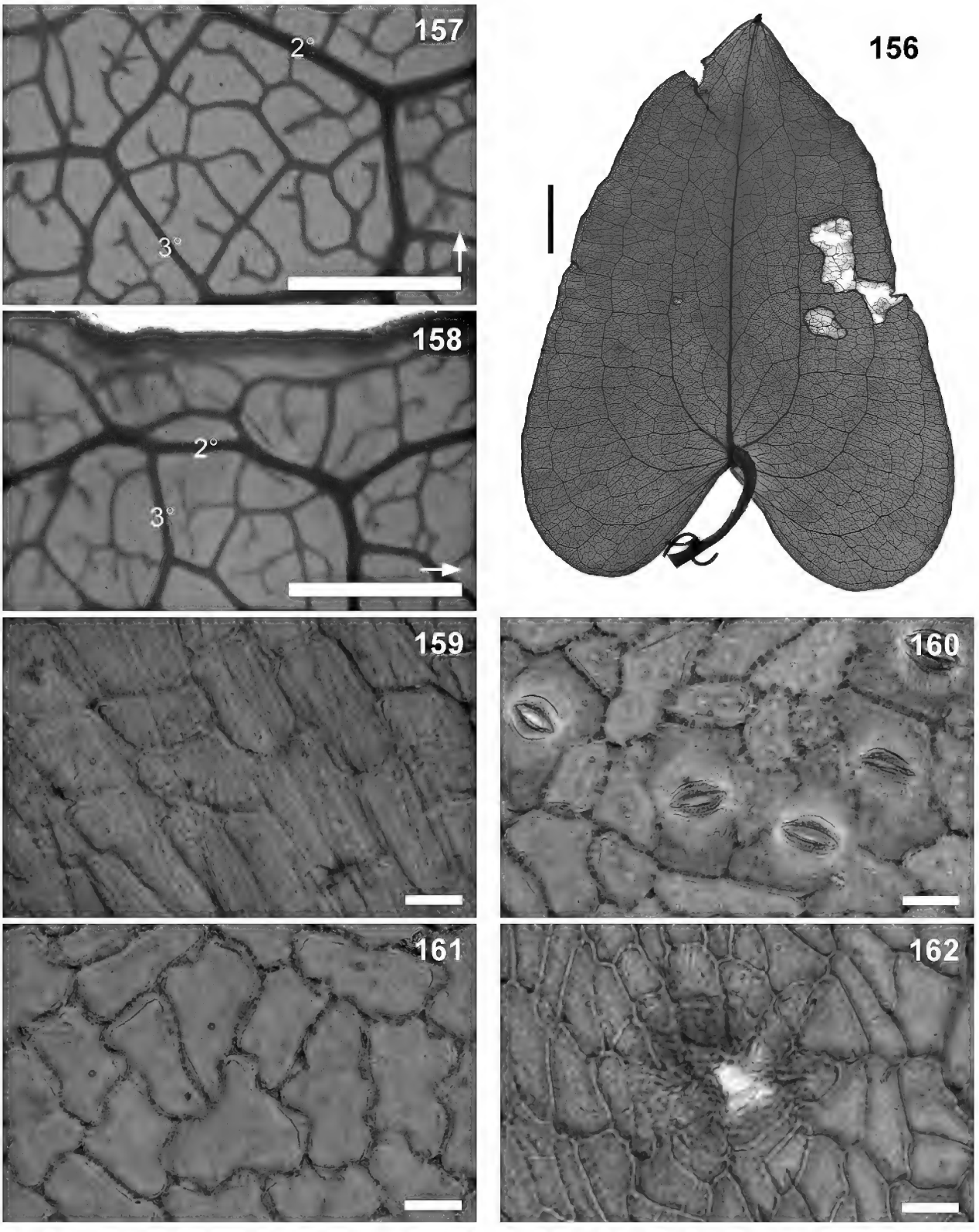

**Figs. 137–143.** *Salix canariensis*. – **137**. Cleared leaf [64]. **138**. Secondary to fifth-order veins, freely ending ultimate veinlets dichotomizing [64]. **139**. Ultimate marginal venation, incomplete loops [64]. **140**. Margin [64]. **141**. Abaxial cuticle, trichomes [63]. **142**. Abaxial cuticle [64]. **143**. Adaxial cuticle, trichome bases [63]. – Scales: 1 cm (137), 1 mm (138–139), 25 µm (140–143).



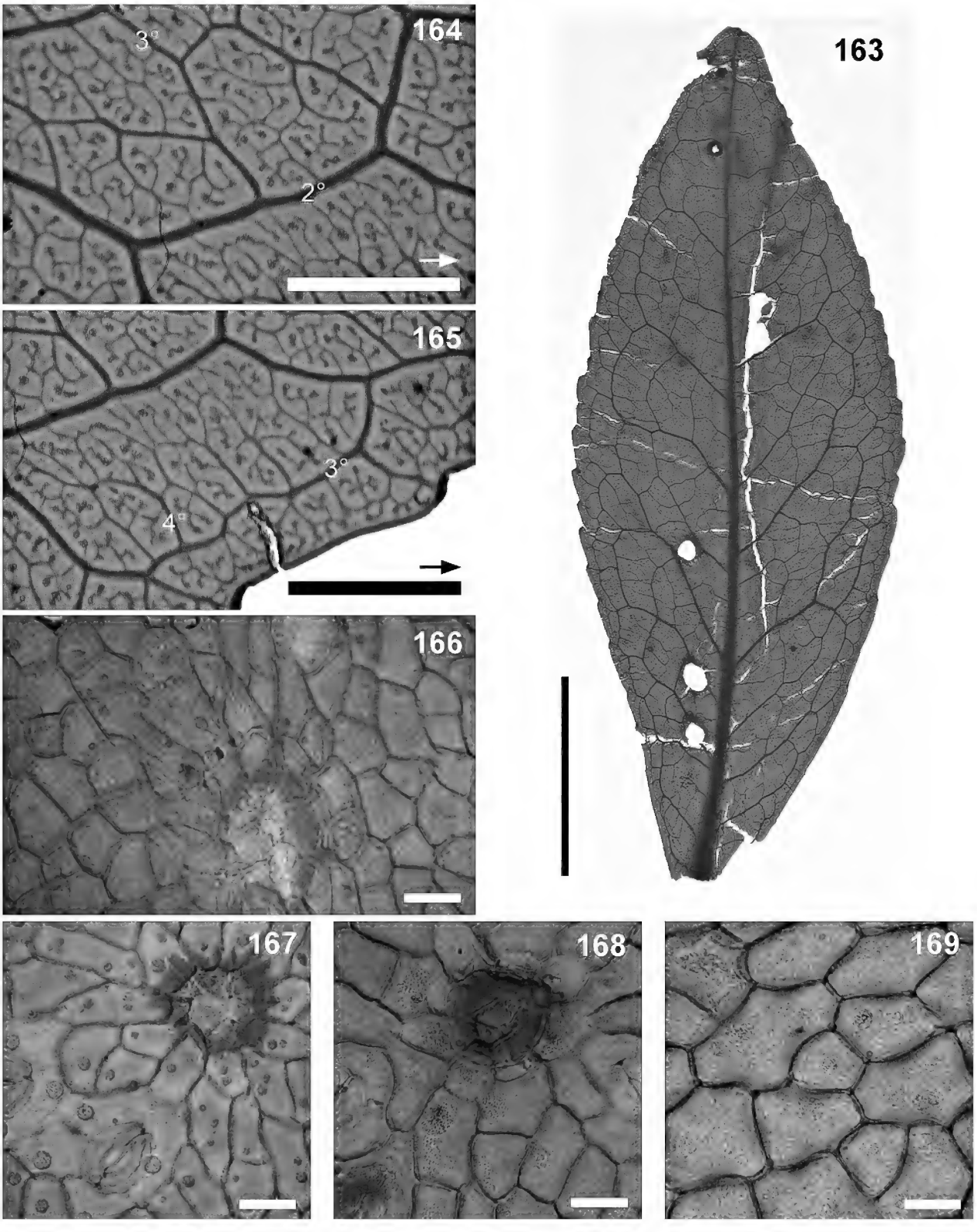

**Figs. 144–149.** *Sideroxylon marmulano*. – **144**. Cleared leaf [STU 1041]. **145**. Secondary to fifth-order veins, freely ending ultimate veinlets dichotomizing [STU 1041]. **146**. Ultimate marginal venation, complete loops [STU 1041]. **147**. Margin [STU 1041]. **148**. Abaxial cuticle [STU 1041]. **149**. Adaxial cuticle [STU 7550]. – Scales: 1 cm (144), 1 mm (145–146), 25 µm (147–149).



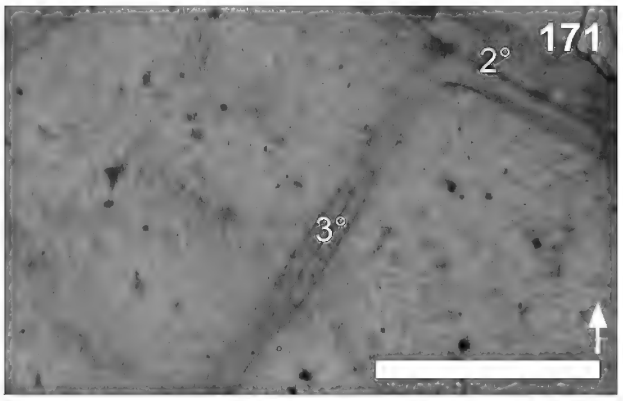

**Figs. 150–155.** *Isoplexis canariensis*. – **150**. Cleared leaf [26]. **151**. Secondary to fifth-order veins, freely ending ultimate veinlets forming polygons or dichotomizing [26]. **152**. Ultimate marginal venation, incomplete loops, tooth [26]. **153**. Margin [26]. **154**. Abaxial cuticle, small trichome base [26]. **155**. Adaxial cuticle, large trichome base [26]. – Scales: 1 cm (150), 1 mm (151–152), 25 µm (153–155).

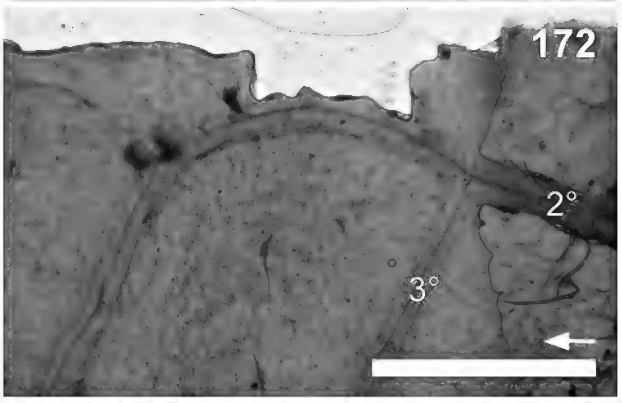


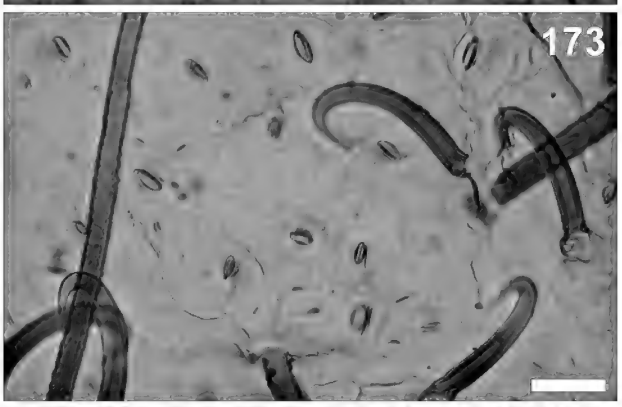

**Figs. 156–162.** *Smilax canariensis*. – **156**. Cleared leaf [13]. **157**. Secondary to fifth-order veins, freely ending ultimate veinlets dichotomizing [13]. **158**. Ultimate marginal venation, complete or incomplete loops [13]. **159**. Margin [13]. **160**. Abaxial cuticle [13]. **161**. Adaxial cuticle [13]. **162**. Abaxial cuticle, secretory pore(?) [13]. – Scales: 1 cm (156), 1 mm (157–158), 25 µm (159–162).

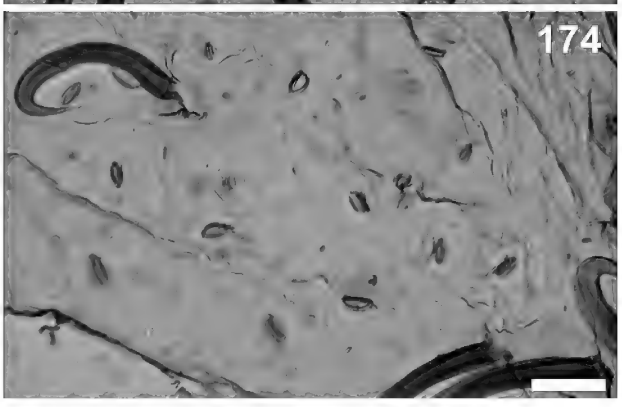


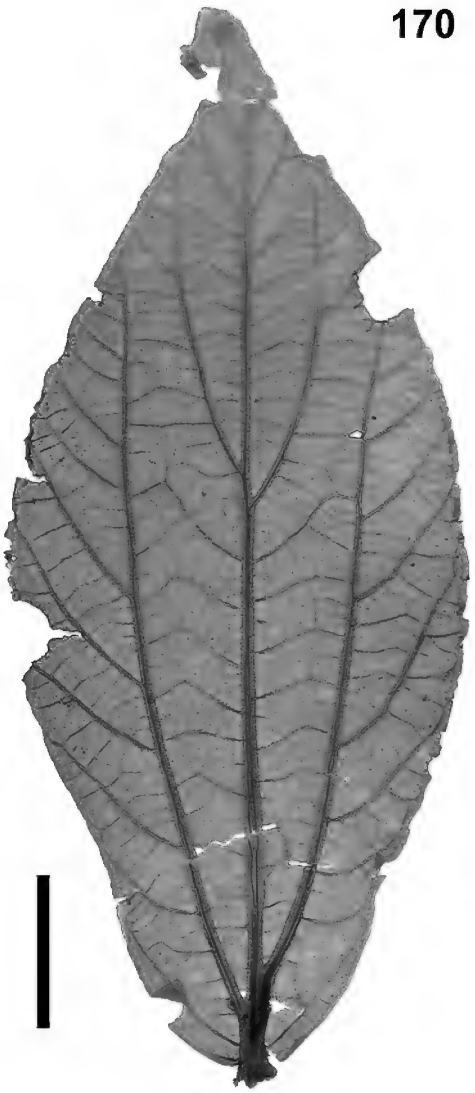

**Figs. 163–169.** *Visnea mocanera*. – **163**. Cleared leaf [8]. **164**. Secondary to fifth-order veins, freely ending ultimate veinlets dichotomizing [8]. **165**. Ultimate marginal venation, incomplete loops, tooth [8]. **166**. Margin, cork-wart [8]. **167**. Abaxial cuticle, cork-wart [8]. **168**. Abaxial cuticle, trichome base [25]. **169**. Adaxial cuticle [25]. – Scales: 1 cm (163), 1 mm (164–165), 25 µm (166–169).

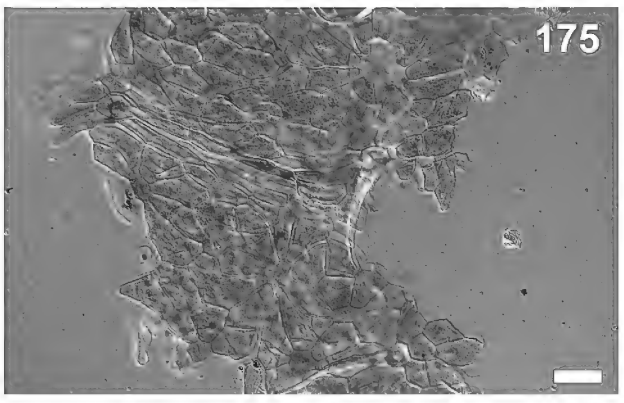



**Figs. 170–175.** *Gesnouinia arborea*. – **170**. Cleared leaf [STU 8669]. **171**. Secondary to tertiary veins [STU 8669]. **172**. Ultimate marginal venation, complete loops [STU 8669]. **173**. Abaxial cuticle, stomata, trichomes [STU 8669]. **174**. Abaxial cuticle, stomata, trichomes [STU 8669]. **175**. Adaxial cuticle, resinous bodies [STU 885]. – Scales: 1 cm (170), 1 mm (171–172), 25 µm (173–174), 50 µm (175).

Leaf attachment opposite, leaf organization simple, petiole short, 0.4–1.6 cm (0.8 cm) long, marginal petiolar attachment, laminar size notophyll – 2 : 1, length 7.4–13.5 cm (9.6 cm), width 3.1–6.2 cm (4.5 cm), elliptic, symmetrical, base and apex angle both acute, base shape almost straight to slightly concavo-convex, apex shape convex, margin entire and somewhat revolute.

Venation: primary vein pinnate; secondaries weakly brochidodromous, curved to recurved, course irregular, secondary vein spacing irregular, 0.9–1.4 cm, one pair of acute basal secondaries running parallel to the margin, secondary vein angle smoothly decreasing towards the base, inter-secondaries occasionally developed; tertiaries polygonal reticulate, sometimes alternate percurrent, tertiary vein angle to primary vein obtuse to sometimes acute, tertiary vein angle variability inconsistent; fourth-order veins regular polygonal reticulate, areolation poorly to moderately developed (5- to more-sided); fifth-order veins dichotomizing; freely ending ultimate veinlets once to twice branched, ultimate marginal venation consisting of sometimes complete, sometimes incomplete loops.

Adaxial cuticle: medium thick, non-modified epidermal cells 19–25 µm (21 µm) in diameter, anticlines straight to undulate, undulation U-shaped, wave length 12–26 µm (19 µm), amplitude 3–9 µm (5 µm); peltate glands scattered, sunken in the cuticle but still somewhat raised, surrounding non-modified epidermal cells arranged circularly, diameter 17–46 µm (27 µm). Marginal cells elongated, end anticlines square to oblique, 21–57 µm (33 µm) long, 6–18 µm (11 µm) wide.

Abaxial cuticle: thin to medium thick, non-modified epidermal cells 9–26 µm (16 µm) in diameter, anticlines straight to undulate, undulation U-shaped, wave length 13–23 µm (16 µm), amplitude 3–8 µm (5 µm); stomatal complexes cyclocytic, 5–6 subsidiary cells, more intensively staining than the non-modified epidermal cells; stomata oval to roundish, 18–26 µm (21 µm) long, 16–26 µm (21 µm) wide with thickened polar I- to T-pieces; stomatal aperture oval, 8–15 µm (10 µm) long; giant stomata present (one observed, 33 × 25 µm); stomatal frequency 8–14 (11); faint but clearly visible striation developed. Glands as described above but more densely spaced, diameter about 45 µm, surrounded by a ring of more intensively staining, slightly elongated epidermal cells (Fig. 113).

Remarks: This foliage is characterized by a basal pair of secondaries running parallel to the margin, by irregularly and widely spaced, somewhat recurved secondaries forking and looping in different distances from the margin, and the slender but distinctive polygonal reticulate network of the tertiaries. Additional diagnostically relevant features are the cyclocytic stomata with thickened and therefore well-staining subsidiary cells and peltate trichomes.

## Rhamnaceae

### *Rhamnus glandulosa* Ait.
(Figs. 117–122)

Material: Herbarium Eder nos. 3, 9, 19 (10 herbarium sheets, cuticles from 3 sheets).

Leaf attachment alternate, leaf organization simple, petiole long, 1.0–2.2 cm (1.6 cm), base slightly swollen, marginal petiolar attachment, laminar size microphyll – 2 : 1, length 2.8–10.1 cm (6.7 cm), width 2.0–4.8 cm (3.4 cm), elliptic, symmetrical, base and apex angle both acute, base shape convex, apex shape acuminate to convex, margin crenate and revolute, circa 3 teeth per centimetre; tooth shape: basally retroflexed to convex, apically convex, sinus rounded, apex non-specific glandular, veinlet ending in the sinus.

Venation: primary vein pinnate, very strong, in the axils of the secondaries big and distinct glands present; secondaries semicraspedodromous, smoothly curved, secondary vein spacing irregular, increasing towards the base, 1.0–2.3 cm, two pairs of basal secondaries, the lower one thin and short running near the margin, the upper one prominent and running steeply into the upper half of the lamina, secondary vein angle smoothly decreasing towards the base, inter-secondaries well developed, often more than one between two adjacent secondaries; tertiaries mixed opposite/alternate percurrent, tertiary vein course straight, tertiary vein angle to primary vein mostly obtuse, tertiary vein angle variability inconsistent; fourth-order veins alternate percurrent, areolation moderately developed; fifth-order veins dichotomizing; freely ending ultimate veinlets twice or more times branched, ultimate marginal venation consisting of loops.

Adaxial cuticle: thick, non-modified epidermal cells polygonal, diameter 11–38 µm (21 µm), anticlines straight; simple trichomes scattered, trichome base a single modified cell, size coherent to normal epidermal cells, trichome body one-celled, cone-shaped, short, the single cell often crooked, length 17–99 µm (34 µm), considerably longer above veins 31–312 µm (94 µm); trichome frequency 9.4. Marginal cells polygonal, anticlines straight, 8–42 µm (18 µm).

Abaxial cuticle: thinner than adaxial one, non-modified epidermal cells polygonal, diameter 9–31 µm (17 µm), anticlines straight; stomatal complexes cyclocytic with 5–7 almost rectangular subsidiary cells which stain less intensively than the non-modified epidermal cells, subsidiaries 11–27 µm (19 µm) long, 7–14 µm (10 µm) wide; stomata oval, 23–35 µm (28 µm) long, 16–27 µm (22 µm) wide; stomatal aperture oval with prominent outer stomatal ledge, aperture 8–18 µm (12 µm) long, 3–10 µm (7 µm) wide, poles more intensively staining than the guard and subsidiary cells; sometimes cuticular striation

present (radially oriented around stomata); stomatal frequency 8; trichomes as described above, trichome frequency 3.1.

Remarks: Apart from the few, widely spaced and steeply ascending secondaries, the large axillary glands are characteristic. Diagnostically valuable are also the cyclocytic stomatal complexes with a ring of only faintly staining subsidiaries and the mostly short, cone-shaped trichomes positioned on comparably large bases.

## Rosaceae

### *Bencomia caudata* Webb & Berthet
(Figs. 123–129)

Material: STU 5352, 8676 (9 herbarium sheets, 2 cuticles).

Leaf organization odd-pinnate (7–13 leaflets), petiole 4.9–25.0 cm (13.1 cm), petiole base swollen, marginal petiolar attachment, laminar size mesophyll – 2 : 1, length 5.5–34.0 cm (16.3 cm), width 4–15 cm (7.2 cm), obovate, symmetrical, base angle acute, apex angle obtuse.

Leaflets: simple, almost sessile or petiolules very short, marginal petiolar attachment, leaflets all sizes from microphyll – 2 : 1 to nanophyll – 1 : 1 (stipules), 0.8–5.0 cm (3.5 cm) long, 0.6–2.2 cm (1.5 cm) wide, ovate, terminal leaflet symmetrical, lateral leaflets base asymmetrical (apical side shorter), base angle obtuse, apex angle acute, base shape rounded, apex shape almost straight to slightly convex, margin simple serrate, 4 teeth per centimetre, spacing regular; tooth shape: basal side convex, apical side slightly flexuous, sinus angular, apex simple.

Venation: primary vein pinnate; secondaries craspedodromous, straight to minimally recurved, secondary vein spacing very dense and uniform, 0.1–0.3 cm, secondaries running parallel to each other, slightly diverging near the margin, secondary vein angle uniform, slightly increasing towards the base; tertiaries alternate percurrent, forming "composite" inter-secondaries, tertiary vein course sinuous, tertiary vein angle to primary vein obtuse, tertiary vein angle relatively uniform; fourth and fifth-order veins regular polygonal reticulate, areolation moderately developed (4- to 5-sided); sixth-order veins dichotomizing; freely ending ultimate veinlets unbranched to once branched, ultimate marginal venation consisting of loops with some fifth-order veins outside of the loops, branches of the secondaries and two tertiaries enter the marginal teeth and fuse directly at the apex.

Adaxial cuticle: medium thick, non-modified epidermal cells polygonal, diameter 13–34 µm (19 µm), anticlines straight; filiform trichomes present, mainly situated above veins, one-celled, about 150 µm long, trichome bases one-celled and circular, small (10 µm in diameter); furthermore, glandular trichomes developed, base simple, quite indistinct, trichome composed of one row of several short cells and an almost spherical head, which is often missing.

Abaxial cuticle: preparation remained unsuccessful.

Remarks: Remarkable are the very densely spaced, straight, and strongly parallel secondaries as well as the inter-secondaries which are composed of alternate percurrent tertiaries. Up to six orders of veins can be discriminated. The abaxial cuticle poorly withstands maceration.

### *Prunus (Laurocerasus) lusitanica* L.
(Figs. 130–136)

Material: Herbarium Eder no. 1 (12 herbarium sheets, cuticle from one sheet).

Leaf attachment alternate, leaf organization simple, petiole 0.4–2.9 cm (1.8 cm) long, base slightly swollen, marginal petiolar attachment, laminar size notophyll – 2 : 1, length 7.4–14.8 cm (10.5 cm), width 2.8–5.5 cm (4.2 cm), elliptic to slightly oval, symmetrical to basally asymmetrical, base and apex angle both acute, base shape convex to rounded, apex shape acuminate, margin crenate, teeth regularly spaced, 2–4 teeth per centimetre; tooth shape: basal side straight to slightly convex, apical side convex, sinus rounded, apex non-specific glandular.

Venation: primary vein pinnate, at the base two glands situated left- and right-hand of the primary vein; secondaries semicraspedodromous, straight to slightly curved, secondary vein spacing rather uniform, 0.8–1.1 cm, secondary vein angle smoothly increasing towards the base, inter-secondaries occasionally developed to absent; tertiaries mixed opposite/alternate percurrent, tertiary vein course sinuous, tertiary vein angle to primary vein obtuse, tertiary vein angle rather uniform; fourth-order veins opposite percurrent, areolation poorly developed (4- to more-sided); fifth-order veins dichotomizing; freely ending ultimate veinlets once to more times branched, ultimate marginal venation consisting of incomplete loops, loops developing close to the marginal teeth sending a short veinlet directly into the tooth apex.

Adaxial cuticle: thick, glabrous, non-modified epidermal cells polygonal, diameter 9–37 µm (23 µm), anticlines straight; cork warts present, raised above the cuticle surface, surrounded by several rings of tangentially elongated cells. Marginal cells somewhat elongated, anticlines straight, 13–30 µm (24 µm) long, 10–25 µm (17 µm) wide.

Abaxial cuticle: thick, glabrous, non-modified epidermal cells polygonal, diameter 12–39 µm (24 µm), anticlines straight to rounded, sometimes weakly undulate, wave length 14–27 µm (19 µm), amplitude 2–7 µm (5 µm);

stomatal complexes incompletely amphicyclocytic with an inner five- to six-celled ring and an incomplete outer ring of subsidiary cells, the outer ring sometimes shared by neighbouring stomata; subsidiaries tangentially slightly elongated, staining more intensely than non-modified cells; stomata oval to roundish, 23–33 µm (28 µm) long, 18–31 µm (25 µm) wide; stomatal aperture oval, bordered by thick outer stomatal ledges, aperture 10–15 µm (13 µm) long, 4–8 µm (6 µm) wide, poles marked by an I-piece of thickened cutin, above the guard cells distinct circular cuticular folds developed; stomata frequently clustered in groups of two to five; stomatal frequency 11; two giant stomata observed (45 × 26 µm and 42 × 29 µm).

Remarks: Among the woody taxa of the Canarian laurel forests, *Maytenus canariensis* and *Visnea mocanera* resemble each other in their rather regular marginal crenation with glandular non-specific apices. Among others, *P. lusitanica* differs by regularly spaced and marginally regularly looping secondaries. The incomplete amphicyclic stomatal complexes are a further distinctive criterion. The glands near the petiole attachment in *P. lusitanica* are a diagnostic feature of the genus *Prunus*.

## Salicaceae

### *Salix canariensis* C. Sm. ex Link
(Figs. 137–143)

Material: Herbarium Eder nos. 63, 64 (13 herbarium sheets, cuticles from 2 sheets).

Leaf attachment alternate to nearly opposite, leaf organization simple, petiole 0.5–1.5 cm (1.1 cm) long, base swollen, marginal petiolar attachment, laminar size microphyll – 3 : 1, length 6–10.1 cm (8.4 cm), width 1.1–3.5 cm (2.5 cm), oblong, almost symmetrical, base and apex angle both acute, base shape convex, apex shape convex to slightly acuminate, margin revolute, entire to crenate, about 4 teeth per centimetre, regularly spaced; tooth shape: basal side convex, apical side concave to straight, sinus rounded, apex simple.

Venation: primary vein pinnate; secondaries festooned brochidodromous, curved and slightly zig-zag, secondary vein spacing irregular, relatively dense, 0.5–0.9 cm, secondary vein angle uniform to increasing towards the base, inter-secondaries well developed, often more than one between two adjacent secondaries; tertiaries mostly opposite percurrent, sometimes alternate percurrent, tertiary vein course sinuous to convex, tertiary vein angle to primary vein obtuse, tertiary vein angle decreasing exmedially; fourth-order veins mixed opposite/alternate percurrent, areolation moderately developed (3- to 5-sided); fifth-order veins rather indistinct, dichotomizing; freely ending ultimate veinlets twice or more times branched, ultimate marginal venation consisting of incomplete loops.

Adaxial cuticle: thick, non-modified epidermal cells almost isodiametric, polygonal, diameter 5–33 µm (15 µm), anticlines straight, cuticle strongly folded. Very long, thin, one-celled trichomes present, base roundish, one-celled with thickened poral rim, diameter 8–21 µm (14 µm), situated mainly upon the veins, surrounding cells deeply staining. Marginal cells distinctly elongated, linear, anticlines straight, end anticlines square to oblique, 16–57 µm (34 µm) long, 6–15 µm (11 µm) wide, with trichomes as described above.

Abaxial cuticle: thinner than adaxial one, non-modified epidermal cells polygonal, diameter 8–35 µm (16 µm), anticlines weakly developed, straight to very slightly rounded, cuticle slightly folded; stomatal complexes brachypara- to paracytic; stomata very small, oval, 9–17 µm (13 µm) long, 5–11 µm (8 µm) wide; stomatal aperture slit-like to oval, almost as long as the stomata, outer stomatal ledges thick and deeply staining, not meeting at the poles; stomatal frequency 16; trichome bases as described above, often in groups of two to four.

Remarks: Foliage of willow is usually distinctive by a combination of traits including regular, largely parallel and curved secondaries, the regular presence of inter-secondaries as well as percurrent tertiaries. The leaf margin is mostly crenate but sometimes entire as in *S. canariensis*. The tertiaries form regular meshes, while higher order veins are less distinctive. Furthermore, diagnostically relevant are the paracytic stomatal complexes in which the subsidiary cells stain less intensively than the non-modified cells.

## Sapotaceae

### *Sideroxylon marmulano* Banks
(Figs. 144–149)

Material: STU 1041, 7550 (5 herbarium sheets, cuticles from 2 sheets).

Leaf attachment opposite to nearly decussate, leaf organization simple, petiole 1.1–4.0 cm (2.6 cm) long, pilose, marginal petiolar attachment, laminar size notophyll – 3 : 1, length 7.2–13.0 cm (10.1 cm), width 3.1–4.5 cm (3.8 cm), elliptic, symmetrical, base and apex angle both acute, base shape slightly convex to concavo-convex, apex shape slightly convex (young leaves emarginate), margin entire and slightly revolute.

Venation: primary vein pinnate; secondaries brochidodromous, curved and faintly zig-zag, secondary vein spacing dense and uniform, 0.4–0.6 cm, secondary vein angle rather uniform, slightly increasing towards the base, one

to several inter-secondaries regularly and well developed; tertiaries and fourth-order veins regular polgygonal reticulate; fifth-order veins partly polygonal, partly dichotomizing, areolation well developed (4- to 5-sided); freely ending ultimate veinlets unbranched to once branched, ultimate marginal venation consisting of loops.

Adaxial cuticle: thick, glabrous, non-modified epidermal cells polygonal, diameter 7–23 µm (13 µm), anticlines straight; margin slightly thickened. Marginal cells somewhat elongated, disorderly linear, end anticlines oblique or square, 8–26 µm (14 µm) long, 6–12 µm (9 µm) wide.

Abaxial cuticle: thick, glabrous, non-modified epidermal cells polygonal, diameter 5–14 µm (10 µm), anticlines straight; stomatal complexes cyclocytic, 7–8 slightly thicker subsidiary cells surrounding the guard cells; stomata broadly oval, 14–24 µm (21 µm) long, 15–23 µm (19 µm) wide; stomatal aperture slender oval, 6–14 µm (10 µm) long, poles with thickened I-piece of cutin; stomatal frequency 6.

Remarks: Gross-morphologically this foliage resembles *Pleiomeris canariensis* in leaf shape and venation pattern, although leaves of *S. marmulano* are usually smaller. Both species are distinctive by the shape of the leaf base (slightly convex to concavo-convex in *S. marmulano*, slightly concavo-convex to cuneate in *P. canariensis*) and fifth-order venation, which develops in *S. marmulano* only. The ultimate veinlets are unbranched to once branched in *S. marmulano* but unbranched to twice branched in *P. canariensis*. Cyclocytic stomatal complexes are characteristic of *S. marmulano*, whereas anisocytic to anomotetracytic complexes are present in *P. canariensis*. Only the latter species bears peltate trichomes.

## Scrophulariaceae

### *Isoplexis canariensis* (L.) Loud.

(Figs. 150–155)

Material: Herbarium Eder no. 26 (11 herbarium sheets, 1 cuticle).

Leaf attachment alternate, forming rosettes at the top of the branches, leaf organization simple, leaf sessile, microphyll – 3 : 1, length 8.1–15.0 cm (11.1 cm), width 1.4–4.0 cm (2.6 cm), elliptic, symmetrical, base and apex angle both acute, base shape decurrent, apex shape straight, margin irregularly crenate/serrate, 1–2 orders of teeth, about 4 teeth per centimetre, spacing and size variable; tooth shape: basal side slightly retroflexed to slightly convex or straight, apical side slightly retroflexed or concave, sinus rounded, apex simple.

Venation: primary vein pinnate; secondaries festooned semicraspedodromous, curved, one pair of slender secondaries running steeply upwards starting from the base until about half the length of the blade, secondary vein spacing wide and irregular, 1.3–3.4 cm, secondary vein angle abruptly decreasing towards the base, inter-secondaries developed; tertiaries random reticulate; fourth-order veins regular polygonal reticulate, areolation well developed; fifth-order veins dichotomizing; freely ending ultimate veinlets unbranched to once branched, ultimate marginal venation consisting of incomplete loops, veinlets originating from the marginal loops enter the teeth, almost touching the apex.

Adaxial cuticle: thick, non-modified epidermal cells tetra- to octogonal, diameter 23–51 µm (36 µm), anticlines thick and straight; cuticle over epidermal secretory bodies intensively staining, ruptured, small, simple trichome bases scattered, surrounded by distinct radial cuticular folding. Marginal cells polygonal, anticlines thick and straight, diameter 25–58 µm (36 µm).

Abaxial cuticle: thinner than adaxial one, non-modified epidermal cells, diameter 3–46 µm (33 µm), anticlines straight to somewhat curved; stomatal complexes anomocytic; stomata oval, often overlapped by epidermal cells and cuticular folds, 23–32 µm (28 µm) long, 18–25 µm (21 µm) wide; stomatal aperture spindle-shaped, 11–19 µm (15 µm) long, outer stomatal ledges thick, deeply staining; stomatal frequency 21; well cutinized, small, and simple trichome bases present, diameter 13–18 µm (15 µm). Cuticle distinctly but finely folded, folds radially oriented around stomata and trichome bases.

Remarks: Due to the traits complex of the cuneate base, the steeply ascending pair of secondary veins, and the irregularly crenate/serrate margin, this foliage cannot be mistaken for any other of the woody taxa of the Canarian laurel forests.

## Smilacaceae

### *Smilax canariensis* Willd.

(Figs. 156–162)

Material: Herbarium Eder no. 13 (11 herbarium sheets, cuticle from one sheet).

Leaf attachment alternate, leaf organization simple, petiole with climbing tendrils, 1.1–2.3 cm (1.8 cm) long, marginal petiolar attachment, laminar size notophyll – 1.5 : 1, length 4.3–10.0 cm (7.4 cm), width 2.5–11.2 cm (5.8 cm), ovate to elliptic, symmetrical, base angle wide obtuse, base shape cordate to hastate to convex, at the base above the veins some spines developed, apex angle acute, apex shape acuminate to straight to convex, margin entire and revolute.

Venation: basal actinodromous/campylodromous, bro-

chidodromous, 3–7 main veins originating at the base, medial one stronger than the lateral ones (= secondaries); secondaries basally recurved then straight, running into the leaf apex; tertiaries connecting the medial vein with the first pair of secondaries, tertiaries originating in acute angles from the medial vein, forming a network with wide meshes, tertiaries interconnecting the secondaries opposite to alternate percurrent, course straight to slightly sinuous; fourth and fifth-order veins regular polygonal reticulate, areolation moderately developed (4- to 5-sided); sixth-order veins dichotomizing; freely ending ultimate veinlets absent, un- to multi-branched, ultimate marginal venation mostly consisting of loops.

Adaxial cuticle: thick, glabrous, non-modified epidermal cells often slightly elongated, 22–76 µm (48 µm) long, 18–39 µm (27 µm) wide, weakly undulate, anticlines very thick and U-shaped, wave length 26–49 µm (34 µm), amplitude 7–12 µm (9 µm). Marginal cells rectangular to isodiametric, long and short cells randomly alternating, anticlines straight, 19–62 µm (48 µm) long, 18–39 µm (26 µm) wide, distinctly striate, striation running parallel to the leaf margin.

Abaxial cuticle: thick, glabrous, non-modified epidermal cells 25–65 µm (43 µm) long, 10–31 µm (22 µm) wide, anticlines very weakly undulate; stomatal complexes (brachy)paracytic; stomata 21–32 µm (26 µm) long, 12–20 µm (15 µm) wide, epidermal wall of guard cells not distinguishable; stomatal aperture spindle-shaped, 13–22 µm (16 µm) long, outer stomatal ledges prominent, accompanied laterally by fine cuticular folds; stomatal frequency variable, 11–20 (16). Secretory pores(?) on veins occasionally present.

Remarks: Due to the basal actino-/campylodromous venation the leaves of this species cannot be mistaken for any other woody taxon of the Canarian laurel forests.

## Theaceae

### *Visnea mocanera* L.
(Figs. 163–169)

Material: Herbarium EDER nos. 8, 25 (17 herbarium sheets, cuticles from 2 sheets).

Leaf attachment alternate, leaf organization simple, petiole short, 0.2–0.7 cm (0.4 cm) long, marginal petiolar attachment, laminar size microphyll – 2 : 1, length 2.9–6.8 cm (5.2 cm), width 1.4–3.1 cm (2.4 cm), elliptic, symmetrical, base and apex angle both acute, base shape convex to straight, apex shape straight and in the uppermost part convex, margin crenate, 6–7 teeth per centimetre, spacing somewhat irregular; tooth shape: basal side straight to convex, apical side convex, sinus rounded, apex non-specific glandular.

Venation: primary vein pinnate; secondaries festooned semicraspedodromous, course irregular, straight, curved to recurved, secondary vein spacing irregular, 0.4–0.8 cm, secondary vein angle decreasing towards the base, intersecondaries present; tertiaries mixed opposite/alternate percurrent, tertiary vein course convex to sinuous, very variable, tertiary vein angle to primary vein very variable, obtuse to sometimes acute, tertiary vein angle variability very inconsistent; fourth-order veins mixed opposite/alternate percurrent to polygonal reticulate, areolation moderately developed (5- to more-sided); fifth-order veins dichotomizing; freely ending ultimate veinlets unbranched to once or more times branched, ultimate marginal venation consisting of incomplete loops, veinlets which originate from loops formed by tertiaries enter the marginal teeth randomly between sinus and apex.

Adaxial cuticle: thick, glabrous, non-modified epidermal cells polygonal, diameter 20–56 µm (34 µm), anticlines straight to curved; marginal cells with the same characteristics, 14–44 µm (26 µm).

Abaxial cuticle: thick, non-modified epidermal cells polygonal, 16–43 µm (29 µm) in diameter, anticlines straight to slightly curved; stomatal complexes aniso-, anomotetracytic to cyclocytic with 3–5 subsidiary cells, subsidiaries staining slightly less intensely than non-modified epidermal cells; stomata oval to roundish, 26–37 µm (30 µm) long, 23–32 µm (27 µm) wide, epidermal wall of guard cells weakly developed; stomatal aperture oval, 11–19 µm (14 µm) long, outer stomatal ledges distinct, bordered by faint folds upon the guard cells, polar T- or I-pieces developed; stomatal frequency 15; simple trichome bases with strongly thickened margin scattered across the surface, trichomes not preserved; solitary, thick-walled, raised, multicellular cork-warts present, diameter of 28–45 µm (35 µm).

Remarks: *V. mocanera* foliage resembles *Prunus lusitanica* and *Maytenus canariensis* of the Canarian laurel forests. Differential characteristics to *P. lusitanica* are discussed above. *V. mocanera* can be distinguished from *M. canariensis* by the shape of the leaf base, which is convex to straight in *V. mocanera* but concavo-convex in *M. canariensis*. *V. mocanera* is characterized by the inconsistent network of the secondary and third-order veins, and by the the percurrent fourth-order venation. In *M. canariensis* the secondaries run in much smoother curves across the lamina, the secondary vein angle is rather uniform, the tertiary vein angle decreases slightly exmedially, and fourth-order veins are regular polygonal reticulate. Among the cuticular features, the stomata are distinctly bigger in *V. mocanera* than in *M. canariensis*.

Urticaceae

*Gesnouinia arborea* (L. fil.) Gaudich
(Figs. 170–175)

Material: STU 8669, 885 (10 herbarium sheets, 2 cuticles).

Leaf attachment alternate, leaf organization simple, petiole 0.7–4.9 cm (2.1 cm) long, pilose, marginal petiolar attachment, laminar size microphyll – 2.5 : 1, length 4.2–10.8 cm (7.1 cm), width 1.8–4.8 cm (2.8 cm), elliptic, symmetrical, base and apex angle both acute, base shape convex to concave, apex shape straight, margin entire to erose; adaxial surface covered by secretory (white) dots.

Venation: suprabasal acrodromous, the central vein ending in the apex, the lateral ones ending in the apical third of the blade; secondaries weakly brochidodromous, one pair (sometimes two pairs) of fine and short secondary veins developed near the very base, running parallel to the leaf margin, secondary vein spacing increasing towards the base, 1.4–2.7 cm, secondary vein angle uniform, intersecondaries not developed; tertiaries opposite percurrent, tertiaries between the main veins hill-shaped, otherwise almost straight, convex to sinuous, tertiary vein spacing irregular, tertiary vein angle increasing towards the base, tertiary vein angle to primary vein mostly obtuse to sometimes acute; fourth-order veins sinuous and opposite percurrent; further venation not developed, ultimate marginal venation consisting of loops.

Adaxial cuticle: extremely delicate, non-modified epidermal cells polygonal with straight-running anticlines, cell arrangement radial around and over mesophyllous resinuous bodies, leaving a central pore for secretion discharge, diameter of non-modified epidermal cells 16–36 µm (27 µm); simple, one-celled, filiform trichomes abundant, often crooked, 73–167 µm (106 µm) long, slightly longer over veins; trichome bases simple, roundish, one-celled, marginally slightly thickened, diameter 6–21 µm (10 µm).

Abaxial cuticle: also extremely delicate, non-modified epidermal cells not discernible; stomata faintly visible, oval to roundish, 11–21 µm (16 µm) long, 9–15 µm (11 µm) wide, epidermal wall of guard cells indistinct, aperture oval, variable in shape, 4–13 µm (8 µm) long, outer stomatal ledges distinct, staining intensely; trichome bases and trichomes as described above.

Remarks: At first glance, isolated litter may resemble laurel foliage with suprabasal acrodromous venation. Even the areolation lacks ultimate veinlets, as in most of the Canarian Lauraceae. However, distinctive gross morphological traits are the thin texture and the thin basal veins running parallel to the margin. The cuticles are very delicate, and the stomatal complexes are not paracytic as in laurels. Moreover, the petiolar and laminar indumentum are distinctive, and the trichome bases are very large. In untreated foliage, the adaxial leaf surface appears densely covered by secretory remains (white dots) when viewed with a hand lens. Cuticular investigation shows circular arrangement of non-modified epidermal cells around densely spaced mesophyllous resinuous bodies bordering a central opening which serves for secretory discharge (Fig. 175). The "white dots" visible in the untreated foliage are clearly situated above these openings. They become removed during the preparation process. It is remarkable that the mesophyllous secretory cells are visible neither in the untreated foliage nor in the cleared leaf under the binocular microscope but are evident when investigating the cuticle.

## 4 Results

The woody species of the Canarian laurel forests are mostly characterized by foliage with unlobed, simple leaf organization. Leaf margin variability is also rather limited, most taxa bearing either entire or crenate/serrate margins. Only three species/subspecies – *Jasminum odoratissimum*, *Bencomia caudata*, and *Sambucus nigra* ssp. *palmensis* – have compound leaves with serrate margin. Thus, gross-morphologically, easily recognizable variability is definitely more limited than in woody floras of temperate climates. For the here-presented study the specific foliar traits have been investigated thoroughly applying the cleared leaf method and cuticular analysis. The trait complexes are described in detail. Based on these results, an identification key relying exclusively on foliage has been developed. In detached and already decaying leaf litter, not all morphological features visible on in situ foliage may be preserved. For example, leaf arrangement on the twig remains unknown in isolated foliage; if leaflets are isolated, then leaf organisation (simple or compound) may be unclear. Also, the freely ending ultimate veinlets may no longer be preserved. The here-presented identification key considers these deficiencies to the extent possible.

### 5 Identification key for litter of isolated foliage

**1** Blade with 3–7 main veins arising at the base and running into the leaf apex. . . . . ***Smilax canariensis*** (Figs. 156–162)
– Venation suprabasal acrodromous, the lateral main veins steeply ascending into the apical part of the lamina. – Leaf surface rough. . . . . ***Gesnouinia arborea*** (Figs. 170–175)
– Other. . . . . **2**

**2** Leaf margin clearly serrate. . . . . **3**
– Leaf margin clearly crenate. . . . . **4**
– Leaf margin crenate/serrate. . . . . **7**
– Leaf margin entire. . . . . **8**
– Leaf margin variable or not unambiguous. . . . . **21**

**3** Margin simple serrate, teeth regularly, densely and evenly

developed; secondary veins craspedodromous. . . . . ***Bencomia caudata*** (Figs. 123–129)
– Margin simple to double serrate, teeth shape variable; secondary venation festooned semicraspedodromous. . . . . ***Sambucus nigra*** ssp. ***palmensis*** (Figs. 15–20)

**4** Tooth apices partly glandular. – Laminar size notophyll – 3 : 1; shape elliptic to obovate; secondaries numerous, densely spaced, not evenly parallel among each other. . . . . ***Arbutus canariensis*** (Figs. 34–40)
– Tooth apices glandular. . . . . **5**

**5** Distinct axillary glands developed at the origin of the secondaries; few secondaries, widely spaced, rather steeply ascending, inter-secondaries present. . . . . ***Rhamnus glandulosa*** (Figs. 117–122)
– Two glands situated at the leaf base to the right and left of the midvein; secondaries numerous, regularly spaced and parallel among each other. . . . ***Prunus lusitanica*** (Figs. 130–136)
– Neither petiolar nor axillary glands. . . . . **6**

**6** Secondaries rather regularly spaced, course regular, network of tertiaries regular; abaxial and adaxial cuticle glabrous. . . . . ***Maytenus canariensis*** (Figs. 28–33)
– Secondaries irregularly spaced, course irregular, network of tertiaries irregular; abaxial cuticle with simple, strongly thickened trichome bases. . . . . ***Visnea mocanera*** (Figs. 163–169)

**7** Laminar size notophyll; secondaries numerous, densely spaced; teeth regularly spaced and evenly sized, tooth apices partly glandular. . . . . ***Arbutus canariensis*** (Figs. 34–40)
– Laminar size microphyll; base decurrent, secondaries widely spaced, the basal pair steeply ascending; teeth shape and size variable, tooth apices non-glandular. . . . . ***Isoplexis canariensis*** (Figs. 150–155)

**8** Laminar size nanophyll – 3 : 1, laminar shape elliptic, base shape cuneate. . . . . ***Hypericum canariense*** (Figs. 46–51)
– Laminar size microphyll. . . . . **9**
– Other. . . . . **13**

**9** Laminar shape oblong. . . . . **10**
– Other. . . . . **11**

**10** Laminar size 5–6 : 1; only mid vein distinct, secondaries hardly visible. . . . . ***Euphorbia mellifera*** (Figs. 41–45)
– Laminar size 3 : 1; secondaries distinct, regularly festooned brochidodromous, inter-secondaries developed. . . . . ***Salix canariensis*** (entire-margined leaf; Figs. 137–143)

**11** Laminar size 1.5 : 1, laminar shape distinctly ovate; tertiaries percurrent. . . . . ***Hypericum grandifolium*** (Figs. 52–57)
– Laminar size 2 : 1, shape elliptic; secondaries recurved, tertiaries random reticulate, stomatal complexes (incomplete) amphicyclocytic to cyclocytic. . . . . ***Ilex canariensis*** (entire-margined leaf; Figs. 1–7)
– Laminar size 2 : 1, shape ovate to somewhat elliptic; tertiaries regular polygonal reticulate, stomatal complexes paracytic. . . . . **12**

**12** Leaf base symmetrical. . . . . ***Jasminum odoratissimum*** (terminal leaflet; Figs. 101–106)
– Leaf base distinctly asymmetrical. . . . . ***Jasminum odoratissimum*** (lateral leaflet; Figs. 101–106)

**13** With a marginal fimbrial vein. . . . . ***Ilex platyphylla*** (entire-margined leaf; Figs. 8–14)
– No fimbrial vein developed. . . . . **14**

**14** Secondaries rather densely spaced and numerous. . . . . **15**
– Secondaries not densely spaced. . . . . **17**

**15** Course irregular, somewhat fluttery, partly forking, partly recurved. – Mesophyllous secretory cells situated in the areoles, peltate trichomes on the abaxial leaf surface. . . . . ***Heberdenia excelsa*** (Figs. 89–94)
– Course of secondaries regular, curved, rather parallel to each other. . . . . **16**

**16** One to two inter-secondaries developed, stomatal complexes cyclocytic. . . . . ***Sideroxylon marmulano*** (Figs. 144–149)
– One to several inter-secondaries well developed, abaxial leaf surface covered by small peltate trichomes. . . . . ***Pleiomeris canariensis*** (Figs. 95–100)

**17** Stomatal complexes paracytic. . . . . **18**
– Other. . . . . **20**

**18** Stellate trichomes positioned above complex trichome bases. – Laminar shape elliptic symmetrical to asymmetrical . . . . ***Viburnum tinus*** ssp. ***rigidum*** (Figs. 21–27)
– Glabrous or simple trichomes positioned above simple trichome bases. . . . . **19**

**19** Abaxial surface with epidermal resinuous cells. . . . . ***Apollonias barbujana*** (entire-margined leaf; Figs. 58–63)
– Shape of stomatal complexes rhomboidal, anticlines strongly undulate, with several to numerous (indistinct) axillary glanduliferous domatia. . . . . ***Laurus azorica*** (Figs. 64–69)
– Shape of stomatal complexes rather quadrangular, strongly thickened cuticular ledges bordering the stomatal aperture, in the basal part of the lamina with 2–3 distinct axillary domatia along the midvein. . . . . ***Ocotea foetens*** (Figs. 70–75)
– Non-modified epidermal cells dome-shaped and somewhat overlapping the stomata, anticlines straight to curved. . . . . ***Persea indica*** (Figs. 76–82)

**20** Stomatal complexes anomocytic, peltate trichomes on two-celled trichome bases. . . . . ***Myrica faya*** (entire-margined leaf; Figs. 83–88)
– Stomatal complexes cyclocytic, peltate glands ad- and abaxially developed, secondaries widely spaced, curved to recurved, course irregular. . . . . ***Picconia excelsa*** (Figs. 107–116)

**21** Leaf margin entire to apically crenate to distinctly serrate; stomatal complexes anomocytic, peltate trichomes positioned on two-celled trichome bases. . . . . ***Myrica faya*** (Figs. 83–88)
– Leaf margin entire to finely, hardly visible, crenate; laminar size microphyll – 3 : 1, shape oblong. . . . . ***Salix canariensis*** (Figs. 137–143)
– Leaf margin finely erose to almost entire; laminar size notophyll – 2 : 1, shape elliptic; stomatal complexes paracytic, with epidermal resinuous cells. . . . . ***Apollonias barbujana*** (Figs. 58–63)
– Leaf margin entire or with spiny, irregularly spaced or single teeth. . . . . **22**

**22** Laminar size notophyll; margin revolute, with a marginal fimbrial vein. . . . . ***Ilex platyphylla*** (Figs. 8–14)
– Laminar size microphyll; no marginal fimbrial vein, secondaries recurved. . . . . ***Ilex canariensis*** (Figs. 1–7)

## 6 The fossil record

As mentioned in the introduction, some Canarian laurel forest species serve for comparison with Palaeogene and Neogene taxa of Europe and are regarded as relicts of the European Paleogene and Neogene laurel forests, e. g. *Visnea mocanera* (Mai 1995). The Cenozoic plant record includes many taxa of yet unknown systematic affinity on

the generic as well as on the family level. This study was designed to provide a better basis for their identification. We therefore briefly summarize the European fossil record of the families present today in the laurel forests of the Canary Islands. This summary follows BENTON (1993) and MAI (1995) and also adds new records.

Aquifoliaceae: Fruits resembling those of modern *Ilex* have occurred in Europe since the Maastrichtian, and leaves have been described repeatedly from the Upper Paleocene onwards. Although carpological remains of *Ilex* are well known from the European Palaeo- and Neogene, e. g. MAI & WALTHER (1991), unambiguous leaf remains are not as abundant, e. g. MÄDLER (1939), KVAČEK & WALTHER (1981, 1998), KVAČEK et al. (2008), WALTHER & KVAČEK (2008).

Caprifoliaceae: Cretaceous leaf remains have been repeatedly assigned to *Viburnum*, but carpological remains are not older than Miocene. Seeds identical with those of modern *Sambucus* occur from the early Eocene onwards, but leaf records remain ambiguous.

Celastraceae: In Europe, *Celastrus*, *Euonymus*, and *Maytenus* have been reported since Paleogene time. However, there are hardly any reliable records of foliage.

Ericaceae: Fossil flowers of an Ericalean s. l. affinity have been described from the Upper Cretaceous of Sweden (SCHÖNENBERGER & FRIIS 2001). First fruit- and seed remains are reported from the Upper Cretaceous of Europe, i. e. *Leucothoe*. Seeds resembling modern *Rhododendron* occur in the Upper Paleocene of Great Britain. The oldest record of *Kalmiophyllum* Kräusel & Weyland (emend. Schneider) derives from Eocene deposits of Ukraine (SCHNEIDER 2004). *Kalmiophyllum* and seeds of *Kalmia* are characteristic of Paleogene and Neogene lignite deposits of Germany. *Arbutus* has been repeatedly listed from Eocene through Pliocene time. By fructifications, the family shows great diversity, especially in the European Middle Miocene whereas the assignment of foliage to the generic level is usually difficult, e. g. KVAČEK & WALTHER (1990), KOVAR-EDER & HABLY (2006).

Euphorbiaceae: Flowers and fruits of Hippomaneae have been recorded from the Lower Eocene of Great Britain. *Euphorbia* is accounted for in the Paleogene and Neogene of Europe.

Hypericaceae: Remains of *Hypericum* are known in Europe since Paleogene time.

Lauraceae: Flower and remains of inflorescences of *Mauldinia* have been reported from the Cenomanian of Bohemia (ECKLUND & KVAČEK 1998). For secure botanical assignment of foliage to the family level, cuticle analysis is an indispensable tool. During the Paleogene and Neogene the family is widely documented, whereby the best and most diverse records are based on foliage but also on wood, fruits, and sometimes even flowers. With few exceptions, however, the assignment of foliage to modern genera is rather problematic, and the numerous fossil morphospecies are usually summarized as *Laurophyllum*. – *L. azorica* is regarded as the next living relative of *L. abchasica* (Kolakovsky & Shakryl) Ferguson (FERGUSON 1974). BŮŽEK et al. (1996) assigned the former *Laurophyllum hradekense* Kvaček & Bůžek to *Ocotea* based on axillary thickenings interpreted as axillary glands and the stomatal structures. The authors stated a close relationship to *O. foetens*. UZUNOVA & STOJANOVA (1999) proposed assigning *Laurophyllum pseudoprinceps* Weyland & Kilpper, among others, to *Ocotea*. This view is yet not widely accepted. The distinctive fruits of *Ocotea* prove the existence of at least four species of this genus from the Lower Eocene to the Upper Pliocene of Europe, of which *O. rhenana* Menzel and *O. heeri* (Gaudin) Mai are regarded as being direct fossil ancestors of *O. foetens* (MAI 1995).

Myricaceae: Leaves and fruits of Myricaceae are known since the late Cretaceous. Endocarps prove the existence of *Myrica* in Europe since early Eocene time. *Comptonia* (documented by foliage and endocarps) has a richer record in the Paleogene than during the Neogene.

Myrsinaceae: The European record of this family, whose modern distribution is concentrated mainly in the southern hemisphere, is somewhat ambiguous and requires revision. *Pleiomerites reticulatus* Ettinghausen (foliage) derives from the Bohemian Paleogene. *Pleiomeropsis rottensis* Weyland, an inflorescence, has been described from the Siebengebirge, Germany. In the European Paleogene and Neogene, the Myrsinaceae are recorded as *Berendtia*, *Myrsinophyllum*, *Myrsinopsis*, *Pleiomeropsis*, and *Rapanea*.

Oleaceae: Foliage from the Cretaceous of Greenland has been assigned to *Fraxinus*, but these records are ambiguous. Winged fruits are as old as Oligocene. *Chionanthus* and *Forestiera* are known since Miocene time. The occurrence of *Olea* and *Syringa* is likely, but the records of *Ligustrum* and *Phillyrea* are doubtful. *Notelea* may be the fossil counterpart of *Picconia* (MAI 1995). Recently, foliage from different Paleogene and Neogene stratigraphic levels has been assigned to the morphogenus *Oleinites* because the exact generic assignment within the Oleaceae is ambiguous (e. g. SACHSE 2001, KVAČEK 2004, KOVAR-EDER & HABLY 2006).

Rhamnaceae: The fossil history of this family is rather difficult to unravel because numerous problematic fossils from Upper Cretaceous onwards have been assigned to it. Well-founded are the occurrences of *Frangula* fruit remains from the Eocene. Earliest records of *Paliurus tiliifolius* (Unger) Bůžek (foliage) derive from Europe and Siberia (Oligocene). Early Oligocene findings of *Ziziphus zizyphoides* (Unger) Weyland (foliage, fruits) are known from the Paratethys region. *Berchemia* foliage has been described from the Miocene and fruit records are known from the Pliocene.

R o s a c e a e: *Rubus* and *Prunus* have been reported since Eocene time, *Pyracantha*, *Rosa*, and *Crataegus* since the early Oligocene. MAI (1995) lists *Comarum*, *Mespilus*, *Potentilla*, and *Pyrus* as immigrants in Europe during Miocene time; in the Pliocene this is additionally true for *Agrimonia*, *Filipendula*, *Cotoneaster*, *Physocarpus*, and *Stephanandra*. Genera recorded exclusively based on foliar gross morphology are *Amelanchier*, *Cydonia*, *Fragaria*, *Malus*, *Spiraea*, and *Sorbaria*.

S a l i c a c e a e: Cretaceous records of foliage from Greenland and Bohemia assigned to *Populophyllum*, *Populites* and *Saliciphyllum* remain ambiguous. In Central Europe both *Salix* and *Populus* occur during the early Oligocene for the first time. Later, both genera are certainly species-rich, but due to leaf variability the species number remains unclear.

S a p o t a c e a e: For this tropical family, MAI (1995) lists *Chrysophyllum*, *Dipholis*, *Illipophyllum*, *Palaquiophyllum*, *Sapotacites*, *Sapotispermum*, *Siderophyllum*, *Sideroxylon* and *Tetracolporopollenites* as having been reported from the Paleogene and Neogene of Europe. Especially Neogene records are ambiguous.

S c r o p h u l a r i a c e a e: *Asarina*, *Gratiola*, *Limosella*, *Paulownia*, *Scrophularia*, and *Verbascum* have been described from the Paleogene and Neogene of Europe.

S m i l a c a c e a e: Leaves of *Smilax* are recorded since Cretaceous time, not only from Europe but also from North America and Armenia. Usually the foliage constitutes an accessory component at single sites. In Europe, *Smilax* already becomes extremely rare in the Middle Miocene. Late Miocene records were detected from the Pannonian basin (HABLY 1992; KOVAR-EDER & HABLY 2006).

T h e a c e a e: According to carpological remains, Ternstroemioidae (*Eurya*, *Ternstroemia*, *Visnea*) and Camellioidae (*Gordonia*, *Polyspora*, *Hartia*, *Schima*) were widespread in Europe from the Paleogene onwards. Based on cuticle diversity, the fossil leaf record reflects a high diversity of this family as well. Modern Theaceae are one of the very few families whose cuticles have been investigated systematically (KVAČEK & WALTHER 1984a) as a basis for the identification of fossil foliage. Nevertheless, the assignment to modern taxa often remained vague, and foliage is often summarized as *Ternstroemites*. KVAČEK & WALTHER (1984b) were also unable to assign fossil material to the genus *Visnea*. The Theaceae leaf record of Bulgaria was investigated by BOZUKOV & PALAMAREV (1995), but *Visnea* was not discovered among the leaf remains. Since Middle Miocene time, the Theaceae record decreased in Europe due to climatic deterioration. Pliocene findings are already restricted to southern Europe.

U r t i c a c e a e: The oldest though not unambiguous record of the family is fruits of *Urticarpum* from the Cretaceous of Great Britain. The Boehmerieae have a continuous European record from the Paleocene to the Pliocene but lack any modern representative. Carpologically, *Fleurya*, *Laportea*, *Parietaria*, *Pilea*, and *Urtica* are present especially in the European Miocene. They are represented by herbaceous species in the modern European flora.

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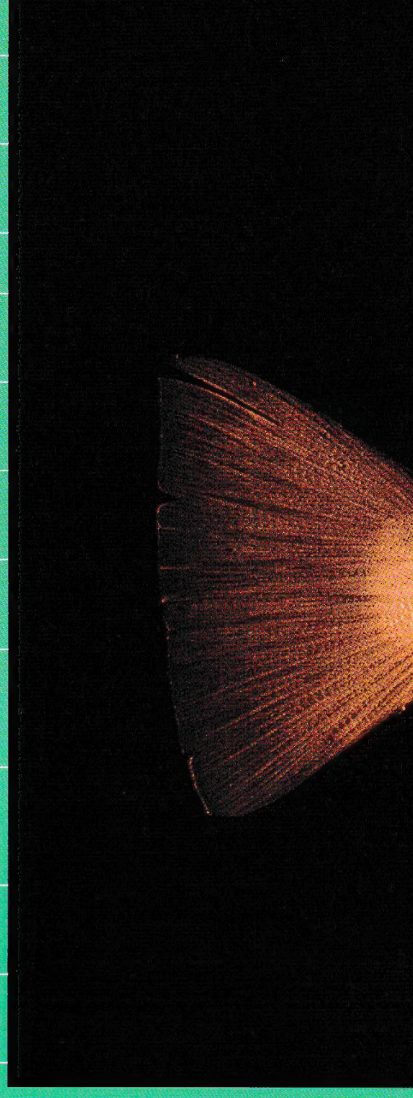
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